US Army Corps of Engineers

U. S. Army Corps of Engineers Kansas City District

CONTRACT NO. W912DQ-11-D-3009, TASK ORDER 0007

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE SOUTH PLAINFIELD, NEW JERSEY

DRAFT FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT

OPERABLE UNIT 3: GROUNDWATER

APRIL 2012

300409

Prepared By:

The Louis Berger Group, Inc.

and

Malcolm Pirnie, Inc.

MALCOLM PIRNIE

THE Louis Berger Group, INC.
565 Taxter Road, Suite 510, Elmsford, New York 10523 USA
Tel 914 798 3710 Fax 914 592 1734 www.louisberger.com

April 06, 2012

U.S. Army Engineer District, Kansas City
Attn: Mr. Ken Maas
601 East 12th Street
Kansas City, MO 64106-2896

Re: Draft Final Baseline Human Health Risk Assessment (BHHRA) Report
Operable Unit 03 (OU-3): Groundwater
Cornell-Dubilier Electronics Superfund Site, South Plainfield, NJ
U.S. Army Corps of Engineers Contract Number W912DQ-11-D-3009, TO 0007

Dear Mr. Maas:

Louis Berger and Malcolm Pirnie are very pleased to submit this Draft Final version of the Baseline Human Health Risk Assessment (BHHRA) Report for Operable Unit 03 (Groundwater) at the Cornell-Dubilier Electronics Superfund Site. This document has been developed in accordance with the Response to Comments (RTC) matrix submitted on December 5, 2011 (which addressed government comments on the June 2011 Draft BHHRA Report), discussions held on December 8th at EPA offices in NYC, and other discussions held between the risk assessor members of the Team subsequent to that.

Because of the size of the document, it cannot be emailed in its entirety. Therefore, it has been uploaded to a Louis Berger Sharepoint site:
https://sp.louisberger.com/usace/CDEOU3/Shared%20Documents/Forms/AllItems.aspx.
To access the site, click on the link while holding down the 'Ctrl' key (or paste it into your browser if clicking does not work) and login with the username "sharepoint\ou3guest" and the password "ou@12345". When you get into the site, you will see a folder labeled Draft Final BHHRA. Click on that folder to open it, and then you will see five files that you can download. You can download by clicking on each file to open, then after it opens (which may take a moment based on your internet connection speed), save it to your drive.

To facilitate your review, we have attached to the transmittal email a clean copy of the text, a redline-strikeout version of the text that highlights the changes from the Draft BHHRA submitted last June, and a copy of the RTC matrix. The Sharepoint site contains those same files, along with one file containing the entire report (text, tables, figures; but no appendices), and this letter.

We are also assembling hard copies for KCD and EPA and will be mailing them out early next week; we hope to have them arrive in your offices by Wednesday (consistent with the

Draft Final RI, three EPA copies are going to Diego and one KCD copy is going to Ken).

Note that the appendices have not been (and will not be) posted to Sharepoint due to their size. We anticipate that they will be included on a disk with the hard copies.

Based on the March 20th version of the schedule, the Government has a 21 calendar day review period; comments are due to Louis Berger / Malcolm Pirnie by April 27th. We understand that the comments will be delivered via Dr. Checks. If any significant comments are received on this document, we will recommend a Team meeting or call be scheduled for after your review period in order to most expeditiously address your comments and progress this document to a Final version.

We look forward to your review of this critical document and discussing it with you. Please call me at 914-798-3711 or Rich Califano at 914-798-3710 if you have any questions.

Very truly yours,

THE LOUIS BERGER GROUP, INC.

Edward A. Dudek Jr., PE
Project Manager

Attachments (electronic files only)

c: USEPA: J. Prince, D. Garcia, D. Cutt, R. Ofrane
USACE KCD: C. Williams, A. Darpinian, J. Lyons, D. Daniel, I. Bowen
LBG: K. Goldstein, R. Califano, S. McDonald
A/MP: D. St. Germain, J. Frederick, J. Karn, A. Vitolins, J. Conklin

Contents

List of Tables

List of Figures

Appendices

ADAF	Age-dependent adjustment factor
ALM	Adult Lead Model
AT	Averaging time
ARAR/TBC	Applicable or Relevant and Appropriate Requirements/To Be Considered
ATSDR	Agency for Toxic Substances and Disease Registry
Bgs	below ground surface
BHHRA	Baseline Human Health Risk Assessment
BW	Body weight
CalEPA	California Environmental Protection Agency
CDE	Cornell-Dubilier Electronics
CLP	Contract Laboratory Program
COPC	Chemical of potential concern
CTE	Central tendency exposure
DA_{event}	Absorbed dose per event
DAD	Dermally absorbed dose
EC	Exposure concentration
ED	Exposure duration
EF	Exposure frequency
EPC	Exposure point concentration
EPM	Equivalent porous medium
ET	Exposure time
EV	Event frequency
FA	Fraction absorbed
FPW	Former production well
FS	Feasibility study
HEAST	Health Effects Assessment Summary Tables
HI	Hazard index
HQ	Hazard quotient
HxCDD	Hexachlorodibenzo-p-dioxin
IEUBK	Integrated Exposure Uptake Biokinetic (Model for Lead in Children)
IR-W	Ingestion rate, groundwater
IRIS	Integrated Risk Information System
Kp	Permeability coefficient

msl	mean sea level
NAPL	Non-aqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
OU	Operable unit
PAH	Polycyclic aromatic hydrocarbon
PbB	Blood lead level
PCB	Polychlorinated biphenyl
PPRTV	Provisional peer-reviewed toxicity value
QAPP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RfC	Reference concentration
RfD	Reference dose
RI	Remedial investigation
RME	Reasonable maximum exposure
ROD	Record of decision
RSL	Regional screening level
SA	Surface area
SVOC	Semi-volatile organic compound
t-event	Event duration
T-event	Lag time per event
TCDD	Tetrachlorodibenzo-p-dioxin
TCE	Trichloroethylene; trichloroethene
TCL	Target compound list
TEF	Toxic equivalence factor
TEQ	Toxic equivalence
UCL	Upper confidence level
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WHO	World Health Organization

Executive Summary

This baseline human health risk assessment (BHHRA) was conducted to support the Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 3 (OU3) at the Cornell-Dubilier Electronics (CDE) Superfund Site (Site). The former CDE facility is located at 333 Hamilton Boulevard in South Plainfield, Middlesex County, New Jersey and covers approximately 26 acres. Between 1936 and 1962, CDE manufactured electronic components, including capacitors. It has been reported that the company also tested transformer oils for an unknown period of time. Polychlorinated biphenyls (PCB) and chlorinated organic degreasing solvents were used in the manufacturing process, and during CDE's period of operation, the company released material contaminated with PCBs and trichloroethene (TCE) directly onto the soils. The primary Site-related contaminants are volatile organic compounds (VOC) and PCBs.

OU3 addresses groundwater. Consistent with the RI Report, the following terminology is used throughout this BHHRA:

- The "Site" refers to all four OUs which comprise the CDE Superfund Site, and the extent of each OU investigation;
- The "former CDE facility" refers to the physical extent of the industrial park operated at 333 Hamilton Boulevard; and
- "OU3" refers to the geographic extent of the groundwater contamination and associated investigation.

The purpose of this BHHRA is to provide an evaluation of potential human health risks, currently and in the future, in the absence of any major action to control or mitigate groundwater contamination (i.e., baseline risks). The potential for adverse health effects was expressed as incremental lifetime cancer risks and non-cancer hazards that were based on assumptions regarding the potential for human exposure to chemicals in groundwater, the estimated concentration of each chemical of potential concern (COPC) at the point of human contact, and the toxicity of each COPC.

The BHHRA followed guidance outlined in the United States Environmental Protection Agency's (USEPA) *Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part A)* (RAGS) (USEPA, 1989) and other relevant USEPA guidance. As such, the BHHRA is composed of the following four parts: data evaluation, exposure assessment, toxicity assessment, and risk characterization (USEPA, 1989; NRC, 1983).

Data Evaluation

The BHHRA is based on the results of groundwater samples collected by Malcolm Pirnie, Inc. in October 2009, March-April 2010, July 2010, December 2010, and March 2011. Groundwater samples were collected from twelve (12) shallow bedrock wells located within the former CDE facility property boundary and twenty (20) deep bedrock wells located throughout the Site. The deep bedrock wells are referred to as FLUTe™ or multi-port wells and were installed with multiple ports to sample, generally, between two and nine discrete depth intervals per well.

Groundwater samples were collected from all wells in October 2009 and March-April 2010 and were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, metals (including mercury), and cyanide. Groundwater samples were collected from a subset of 24 wells in March-April 2010 and July 2010 for PCB congener and dioxin/furan analyses. In December 2010 and March 2011, groundwater samples were collected from only the newly-installed MW-23 and were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, metals (including mercury), and cyanide. Based on review of the laboratory data and USEPA Region 2 data validation reports, the majority of the groundwater data was of acceptable quality overall but subject to the data validator's qualifying remarks. However, following review of the validated PCB congener data from March-April 2010, it was decided not to use the PCB congener and dioxin/furan data from MW-11.[1]

Based on the conceptual understanding of Site-specific hydrogeology and to facilitate evaluation of the potential for human exposure to groundwater through the various pathways outlined in the Site Conceptual Exposure Model, the following groundwater exposure units were established for this BHHRA:

- Entire aquifer – includes groundwater data from all wells and across all sample depths (see Figure 2-1). However, groundwater data from ERT-8 were not included, because it is an upgradient well that defines the southern edge of groundwater

[1] The March-April 2011 PCB congener data from MW-11 were qualified by the USEPA data validator as non-detect at elevated reporting limits due to method blank and equipment rinseate blank contamination.

contamination associated with the former CDE facility and as such, is considered representative of background conditions.

- Shallow onsite groundwater – includes groundwater data from the shallow bedrock monitoring wells and the most shallow sampler port in each multi-port well located within the former CDE facility property boundary (see Figure 2-2).

- Shallow offsite groundwater, south of Bound Brook – includes groundwater data from the most shallow sampler port in each of the multi-port wells located outside the former CDE facility property boundary and south of Bound Brook. Groundwater data from ERT-8 were not included, because it is an upgradient well that defines the southern edge of groundwater contamination associated with the former CDE facility and as such, is considered representative of background conditions. (See Figure 2-3.)

- Shallow offsite groundwater, north of Bound Brook – includes groundwater data from the most shallow sampler port in each of the multi-port wells located outside the former CDE facility property boundary and north of Bound Brook (see Figure 2-4).

The entire aquifer was considered a single exposure unit, due to the nature of potential commercial/industrial and residential exposure to groundwater (e.g., through ingestion of potable water drawn from a private or municipal supply well). Shallow groundwater was separated into these three exposure units, to evaluate the potential exposure of a particular receptor population (i.e., construction/utility workers) that is not expected to also be exposed to groundwater at depth.

COPCs were identified in each groundwater exposure unit, based primarily on comparison of the maximum concentration of each detected chemical to the USEPA Regional Screening Levels for tap water but including other selection criteria as well.

Exposure Assessment

Representative exposure point concentrations (EPC) to be used in the calculation of lifetime incremental cancer risks and non-cancer hazards were estimated for each COPC. Concentrations in groundwater and indoor air were calculated to evaluate human exposure through the potential pathways and exposure routes outlined in the Site Conceptual Exposure Model. This model describes the scenario timeframe, exposure medium, exposure point, and the exposure pathways and routes by which human receptors may be exposed to COPCs originating in groundwater.

Based on the current and most likely future land uses of the Site, the following human receptor populations were identified: commercial/industrial workers, resident adults, resident children, and construction/utility workers. The potential for dermal contact and inhalation exposure to chemicals in groundwater used for process or industrial uses was evaluated for commercial/industrial workers. The potential for ingestion, dermal contact, and inhalation exposure to chemicals in groundwater used as a source of potable water was evaluated for resident adults and children. The potential for dermal contact and inhalation exposure to chemicals in groundwater that pools at the bottom of a trench excavated for utility work was evaluated for construction/utility workers. The applicable exposure unit for the commercial/industrial worker, resident adult and resident child exposure scenarios was the entire aquifer. Each of the three shallow groundwater exposure units was used in a separate evaluation of potential construction/utility worker exposure.

To evaluate ingestion and dermal contact exposures, EPCs for COPCs in groundwater were calculated as the 95% upper confidence limit (UCL) on the arithmetic average concentration using the USEPA's ProUCL version 4.1.00 software. In cases where the 95% UCL concentration was greater than the maximum detected concentration, the maximum concentration was retained as the EPC. In addition, the maximum concentration was retained as the EPC for chemical data sets with greater than 70% non-detect results. To evaluate inhalation exposures for resident adults and children, concentrations of the volatile COPCs in indoor air were estimated using the "Schaum Model." A modified version of the Schaum Model was used to estimate concentrations of volatile COPCs in indoor air to evaluate commercial/industrial worker exposure. To evaluate inhalation exposures for construction/utility workers, concentrations of volatile COPCs in outdoor air around an excavation were estimated by calculating COPC-specific emission fluxes and predicting COPC concentrations using a screening-level atmospheric dispersion model.

USEPA-recommended equations and exposure parameter values were used to estimate human exposure in the form of daily chemical intakes, dermally absorbed doses, or exposure concentrations. These exposure estimates were then combined with chemical-specific toxicity information to estimate incremental lifetime cancer risks and non-cancer hazards in the Risk Characterization. In accordance with USEPA guidance, estimates of reasonable maximum exposures (RME) and, where applicable, central tendency exposures (CTE) were generated. Use of RME parameter values simulates the highest exposure that might reasonably be expected to occur, one that is well above the average case but within the range of possibility, and results in upper-bound incremental lifetime cancer risks and non-cancer hazards. Evaluation of the RME scenario serves as the determination regarding remedial action.

Toxicity Assessment

Chemical-specific toxicity information is in the form of cancer potency slope factors or unit risk factors and non-cancer reference doses or reference concentrations. Toxicity values were obtained from the following hierarchy of sources recommended by the USEPA (2003c): USEPA's Integrated Risk Information System, USEPA's Provisional Peer-Reviewed Toxicity Values, and additional sources, including but not limited to the California Environmental Protection Agency and the Agency for Toxic Substances and Disease Registry.

The USEPA has not derived toxicity values for lead. Rather, the potential for adverse health effects from exposure to lead is evaluated through comparison of predicted blood lead levels to a health-protective goal. The USEPA's stated goal for lead is that children have no more than a 5% probability of exceeding a PbB (blood lead) level of 10 μg/dL. As such, this level is assumed to also provide protection for adults. The USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children was used to evaluate resident child exposure to lead in groundwater used for drinking water.

Risk Characterization

Individual (i.e., COPC-specific) incremental lifetime cancer risks and non-cancer hazard quotients were calculated for each potential human receptor population. For the construction/utility worker, separate risk estimates were generated for each of the three shallow groundwater data sets.

Individual incremental lifetime cancer risks are expressed as unitless probabilities (e.g., 2E-06 or 2 in 1,000,000) of a person developing cancer. The individual cancer risks for each exposure scenario were summed to arrive at an estimate of the total cancer risk from exposure to multiple chemicals. For known or suspected carcinogens, the National Oil and Hazardous Substances Contingency Plan (NCP) established that acceptable exposure levels are generally concentration levels that represent an incremental upper-bound lifetime cancer risk in the range from 10^{-4} (i.e., 1E-04 or 1 in 10,000) to 10^{-6} (i.e., 1E-06 or 1 in 1,000,000) or less. The cancer risks estimated for each exposure scenario were compared to this risk range established by the NCP.

Non-cancer hazard is expressed as the unitless ratio, termed the hazard quotient (HQ), of the daily chemical intake or exposure concentration to the non-cancer reference dose or reference concentration. For systemic toxicants, the NCP established that "acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effects during a lifetime or part of a lifetime, incorporating an adequate margin of safety" (USEPA, 1990). As the non-cancer reference dose is protective of the potential for adverse, non-cancer health effects, HQs greater than 1E+00 indicate the potential for non-cancer hazard. The total individual non-cancer HQs were summed for each exposure scenario to yield hazard indices (HI) that reflect the potential for adverse, non-cancer health effects from exposure to multiple chemicals.

Table ES-1 presents the incremental lifetime cancer risks and non-cancer hazards for each RME scenario evaluated in the BHHRA for OU3. As shown, the incremental lifetime cancer risks ranged from 8E-07 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 7E-03 for the resident adult exposure to the entire aquifer. Incremental lifetime cancer risks for the commercial/industrial worker, resident adult, and resident child were greater than the cancer risk range established by the NCP. The potential for cancer risk indicated for commercial/industrial workers was largely attributable to concentrations of TCE in the entire aquifer, while cancer risks for the resident adult and resident child were primarily attributable to concentrations of TCE and arsenic in the entire aquifer. However, concentrations of other chemicals in the entire aquifer [i.e., tetrachloroethene, vinyl chloride, total PCB Aroclors, dibenzo(a,h)anthracene, heptachlor, and 2,3,7,8-TCDD TEQ] also resulted in cancer risks greater than the risk range established by the NCP. The cancer risks estimated for the construction/utility worker were less than or within the risk range established by the NCP for all three shallow groundwater exposure units.

Non-cancer HIs estimated under the RME scenarios ranged from 3E+00 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 7E+02 for the resident child exposure to the entire aquifer. The non-cancer HIs were greater than 1E+00 for all potential human receptors, indicating there is the potential for adverse, non-cancer health effects from exposure to groundwater. For all receptors evaluated, the potential for adverse, non-cancer health effects was indicated for total PCB Aroclors. For the resident adult and resident child, the predominant contributor to the non-cancer hazard was cis-1,2-dichloroethene. However, concentrations of 1,2,4-trichlorobenzene, 2,3,7,8-TCDD TEQ, and arsenic also resulted in non-cancer HIs greater than 1E+00.

Table ES-1
Summary Table: Human Health Cancer Risks and Non-cancer Hazards for RME Scenario
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Exposure Medium	Human Receptor Population	Incremental Lifetime Cancer Risks				Non-Cancer Hazard Indices			
		Exposure Routes			Receptor Total	Exposure Routes			Receptor Total
		Ingestion	Dermal Contact	Inhalation		Ingestion	Dermal Contact	Inhalation	
Entire Aquifer	Commercial/Industrial Worker	N/A	1E-03	3E-03	4E-03	N/A	8E+01	2E+01	9E+01
Shallow Onsite Groundwater	Construction/Utility Worker	N/A	5E-05	5E-08	5E-05	N/A	7E+01	4E-03	7E+01
Shallow Offsite Groundwater, South Bound Brook	Construction/Utility Worker	N/A	3E-05	2E-09	3E-05	N/A	2E+01	4E-05	2E+01
Shallow Offsite Groundwater, North Bound Brook	Construction/Utility Worker	N/A	8E-07	5E-10	8E-07	N/A	3E+00	2E-05	3E+00
Entire Aquifer	Resident Adult	4E-03	2E-03	1E-03	7E-03	2E+02	9E+01	4E+00	3E+02
Entire Aquifer	Resident Child	2E-03	9E-04	5E-04	3E-03	5E+02	2E+02	1E+01	7E+02

Notes
N/A - Not applicable
Cancer risks for the resident adult were calculated as 6 years at the child's rate of exposure and 24 years at the adult's rate of exposure.

Table ES-2 presents the incremental lifetime cancer risks and non-cancer hazards for the CTE scenario. The incremental lifetime cancer risks ranged from 2E-07 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 1E-03 for the resident child exposure to the entire aquifer. Incremental lifetime cancer risks for the commercial/industrial worker, resident adult, and resident child were greater than the cancer risk range established by the NCP.

Non-cancer HIs ranged from 3E+00 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 4E+02 for the resident child exposure to the entire aquifer. Again, the non-cancer HIs were greater than 1E+00 for all potential human receptors, indicating there is the potential for adverse, non-cancer health effects from exposure to groundwater.

Table ES-2
Summary Table: Human Health Cancer Risks and Non-cancer Hazards for CTE Scenario
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Exposure Medium	Human Receptor Population	Incremental Lifetime Cancer Risks				Non-Cancer Hazard Indices			
		Exposure Routes			Receptor Total	Exposure Routes			Receptor Total
		Ingestion	Dermal Contact	Inhalation		Ingestion	Dermal Contact	Inhalation	
Entire Aquifer	Commercial/Industrial Worker	N/A	2E-04	4E-04	6E-04	N/A	6E+01	9E+00	7E+01
Shallow Onsite Groundwater	Construction/Utility Worker	N/A	1E-05	1E-08	1E-05	N/A	6E+01	3E-03	6E+01
Shallow Offsite Groundwater, South Bound Brook	Construction/Utility Worker	N/A	8E-06	6E-10	8E-06	N/A	2E+01	3E-05	2E+01
Shallow Offsite Groundwater, North Bound Brook	Construction/Utility Worker	N/A	2E-07	1E-10	2E-07	N/A	3E+00	2E-05	3E+00
Entire Aquifer	Resident Adult	5E-04	3E-04	5E-05	8E-04	1E+02	6E+01	8E-01	2E+02
Entire Aquifer	Resident Child	8E-04	5E-04	6E-05	1E-03	2E+02	1E+02	1E+00	4E+02

Notes
N/A - Not applicable
Cancer risks for the resident adult were calculated as 6 years at the child's rate of exposure and 24 years at the adult's rate of exposure.

Further evaluation of the entire aquifer data set revealed relatively elevated COPC concentrations in a few wells located within the former CDE facility boundary. The presence of these concentrations may bias the calculated EPCs high, such that the cancer risks and non-cancer hazards estimated using the entire aquifer data set may not reflect the potential for adverse health effects from exposure to groundwater across the Site. An alternate evaluation was therefore presented in the Risk Characterization, in which the EPCs used to estimate the baseline cancer risks and non-cancer hazards were replaced with alternate EPCs calculated using data sets excluding MW-06, MW-11, MW-12, and MW-14S. While some risk reduction was afforded, the cancer risks and non-cancer hazards estimated using the revised EPCs were still greater than the risk range established by the NCP and the target non-cancer HI of 1E+00. Based on this evaluation, the potential for adverse health effects indicated in this BHHRA cannot be explained by groundwater concentrations detected in the onsite monitoring wells alone. In addition, even after excluding these COPC concentrations from the entire aquifer data set, many COPCs have one or more elevated concentrations compared to federal or NJDEP MCLs: 13 VOCs, three SVOCs, five pesticides, PCB Aroclors, and eight metals.

A separate evaluation of uncertainty was conducted using only groundwater data from ERT-5, ERT-6, and MW-18. The RI Report established that groundwater samples collected from these wells (located within the Pitt Street Well Contamination Area, west of the former CDE facility) contained several chlorinated VOCs at concentrations that exceed potential cleanup standards. Several lines of evidence were presented in Section 5.13.2 of the RI Report to suggest the former CDE facility is not the source of impacts in these wells; however, the results are not conclusive. Therefore, groundwater data from ERT-5, ERT-6, and MW-18 were included in the entire aquifer and shallow offsite, south of Bound Brook data sets evaluated in this BHHRA. However, to determine the relative contribution that groundwater data from these offsite wells make to the baseline cancer risks and non-cancer hazards, EPCs were calculated using only groundwater data from ERT-5, ERT-6, and MW-18 and were used in the intake and risk calculations for the commercial/industrial worker, resident adult, and resident child. The cancer risks and non-cancer hazards estimated for groundwater from these sidegradient wells indicates a potential source area other than the former CDE facility.

The primary Site-related contaminants are chlorinated VOCs and PCBs. This BHHRA confirmed there is a potential for unacceptable cancer risk and non-cancer hazard from exposure to concentrations of TCE and its degradation products (e.g., cis-1,2-dichloroethene and vinyl chloride), total PCB Aroclors, and 2,3,7,8-TCDD TEQ in groundwater. The potential for risk indicated for residential exposure to arsenic in the entire aquifer is likely attributable to background conditions in central New Jersey.

For the evaluation of the potential for adverse health effects from resident child exposure to lead in drinking water, the geometric mean blood lead (PbB) concentration estimated using the IEUBK model is 2.6 μg/dL. The probability that the PbB concentration is greater than 10 μg/dL is 0.22 percent. Therefore, lead concentrations in groundwater should not pose a risk to resident children or, by extension, to resident adults.

1. Introduction

This risk assessment presents an evaluation of potential human health risks associated with exposure to chemicals detected in groundwater at the Cornell-Dubilier Electronics (CDE) Superfund Site (Site) [EPA ID: NJD981557879].

The objectives of the risk assessment are to:

- Evaluate potential human health risks, currently and in the future, in the absence of any major action to control or mitigate groundwater contamination (i.e., baseline risks).
- Assist in determining the need for and extent of groundwater remediation.
- Provide a basis for comparing remedial alternatives and determining which will meet the goals of protection of human health and the environment and Applicable or Relevant and Appropriate Requirements (ARAR), as defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 CFR Part 300.5).

The baseline human health risk assessment (BHHRA) follows guidance outlined in the United States Environmental Protection Agency's (USEPA) *Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual Part A* (RAGS) (USEPA, 1989) and other USEPA guidance cited throughout this document. The BHHRA is presented in a series of tables that follow the USEPA's RAGS Part D (USEPA, 2001) format. These tables are provided in Appendix A.

The BHHRA is based on the results of groundwater samples collected in October 2009, March-April 2010, July 2010, December 2010, and March 2011. The groundwater sampling methodology and nature and extent of groundwater contamination are discussed in the Remedial Investigation (RI) Report for Operable Unit 3 (OU3), of which this BHHRA is a part. Historical data from previous Site investigations are summarized herein but were not included in the quantitative assessment of human health risks.

Consistent with the RI Report, the following terminology is used throughout this BHHRA:

- The "Site" refers to all four OUs which comprise the CDE Superfund Site, and the extent of each OU investigation;

- The "former CDE facility" refers to the physical extent of the industrial park operated at 333 Hamilton Boulevard; and

- "OU3" refers to the geographic extent of the groundwater contamination and associated investigation.

The following provides an overview of the Site location and background, a summary of previous Site investigations, and descriptions of the key physical attributes, surrounding land uses, and demographics.

1.1. Site Location and Background

The former CDE facility is located at 333 Hamilton Boulevard in South Plainfield, Middlesex County, New Jersey and covers approximately 26 acres. Most recently, the property was known as the Hamilton Industrial Park. It contained numerous buildings that were demolished by the USEPA in 2008 following relocation of the industrial park tenants.

As shown on Figure 1-1, the former CDE facility is bounded on the northeast by Bound Brook and the former Lehigh Valley Railroad, Perth Amboy Branch (presently Conrail); on the southeast by Bound Brook and a property used by the South Plainfield Department of Public Works; on the southwest, across Spicer Avenue, by single family residential properties; and to the northwest, across Hamilton Boulevard, by mixed residential and commercial properties.

The Spicer Manufacturing Company operated a manufacturing plant on the property from 1912 to 1929. They manufactured universal joints and drive shafts, clutches, drop forgings, sheet metal stampings, screw products, and coil springs for the automobile industry. The plant included a machine shop, box shop, lumber shop, scrap shop, heat treating building, transformer platform, forge shop, shear shed, boiler room, acid pickle building, and die sinking shop. A chemical laboratory for the analysis of steel was added in 1917. Most of the major structures were erected by 1918. When the Spicer Manufacturing Company ceased operations at the facility, the property consisted of approximately 210,000 square feet of buildings (FWENC, 2002). Even though trichloroethene (TCE) was commercially available during the latter half of Spicer Manufacturing Company's period of operation at the former CDE facility, there is no documentation that TCE was used in the manufacturing process during their period of operation at the former CDE facility.

After the departure of the Spicer Manufacturing Company, CDE manufactured electronic components, including capacitors, from 1936 to 1962. It has been reported that the company also tested transformer oils for an unknown period of time. Polychlorinated biphenyls (PCB) and chlorinated organic degreasing solvents were used in the manufacturing process, and the company disposed of PCB-containing materials and other hazardous substances at the facility. It has been reported that the rear of the property was saturated with transformer oils and capacitors were also buried behind the facility during the same period (FWENC, 2002).

Since CDE's departure from the facility in 1962, it has been operated as a rental property consisting of commercial and light industrial tenants. Numerous tenants have occupied the complex. In 2007, the USEPA began implementing the OU2 ROD with the relocation of the tenants at the industrial park and demolition of the 18 buildings. Relocation of the tenants was completed in mid-2007; demolition of the buildings was completed in May 2008; and OU2 soil remedial activities are ongoing. A Plan View of the former CDE facility, showing the location of former buildings, is shown on Figure 1-2 in the RI Report.

The developed portion of the facility (the northwestern portion) comprised approximately 45 percent of the total land area and contained temporary asphalt capping following building demolition, a system of catch basins to channel stormwater flow, and paved roadways. Several of the catch basins drained into a stormwater collection system with outfalls that discharge at various locations along Bound Brook. The other 55 percent of the property was predominantly vegetated before OU2 remedial activities began. The central part of the undeveloped portion was primarily an open field, with some wooded areas to the northeast and south, and a deteriorated, partially paved area in the middle of the undeveloped portion of the facility. The northeast and southeast boundaries consist primarily of wetland areas adjacent to Bound Brook, which flows from the eastern corner across the northeastern border of the undeveloped portion of the facility (FWENC, 2002). Once OU2 remedial activities are completed (anticipated to be late 2012) the entire former CDE facility will be covered by an asphalt cap with a storm water collection system.

1.2. Previous OU3 Investigations

Environmental conditions at the former CDE facility were first investigated by the New Jersey Department of Environmental Protection (NJDEP) in 1986. Subsequent sampling by the NJDEP and USEPA revealed elevated concentrations of PCBs, VOCs, and inorganic chemicals in soil, surface water, and sediment. In 1997, the USEPA conducted a preliminary investigation of Bound Brook and also collected surface soil and interior dust samples from nearby residential and commercial properties. These investigations led to fish consumption advisories for Bound Brook and its tributaries. As a result of these sampling activities, the Site was added to the National Priorities List (NPL) in July 1998. Between 1997 and 2000, the USEPA ordered several removal actions to be performed, including:

- Removing PCBs in interior dust and soils at residential properties located west and southwest of the former CDE facility.
- Paving driveways and parking areas, installing a security fence, and implementing drainage controls at the property.

In 2000, an RI was conducted by Foster Wheeler, Inc. that included the collection of soil, sediment, and building surface samples, as well as the installation and sampling of twelve shallow bedrock monitoring wells (MW-01A, MW-02A, and MW-03 through MW-12). Groundwater samples were also collected from a former production well ("Former Production Well Number 3") at the former CDE facility (FWENC, 2001b). Shortly thereafter, the USEPA divided the Site into four OUs, as follows, to facilitate investigation and remediation:

- OU1 addresses residential, commercial, and municipal properties in the vicinity of the former CDE facility.
- OU2 consists of former CDE facility soils and buildings.
- OU3 consists of groundwater.
- OU4 addresses Bound Brook.

RODs were issued for OU1 and OU2, respectively, in September 2003 and September 2004. This BHHRA was conducted as part of the RI/Feasibility Study (FS) for OU3.

In January 2008, seven deep bedrock wells (ERT-1 through ERT-7) were drilled by the USEPA to assess the hydraulic properties of the fractured bedrock and water quality of the bedrock groundwater up- and down-gradient of the former CDE facility. The wells were drilled to an average depth of 150 feet below ground surface (bgs). In February 2008, one additional deep bedrock well (ERT-8) upgradient of the former CDE facility was also drilled. Prior to installation of these wells, groundwater samples for VOC analysis were collected from multiple depths using packer sampling techniques, targeting discrete water bearing zones within each well. ERT-1 through ERT-6 and ERT-8 were completed by the USEPA in June 2008 with FLUTe™ multi-port sampling devices. In August 2008, groundwater samples were collected by the USEPA from these seven FLUTe™ wells[2] and the twelve shallow bedrock monitoring wells and were analyzed for VOCs, semi-volatile organic compounds (SVOC), pesticides, PCB Aroclors, and metals. Figure 1-2 depicts the locations of the twelve shallow bedrock wells and eight deep bedrock wells drilled prior to 2009. The historical groundwater data are presented and summarized in Appendix B.

1.3. Physical Characteristics of the Site

The following is a general description of the physical characteristics of the Site.

1.3.1. Surface Features

Figure 1-3 contains a topographic map of the former CDE facility and surrounding areas. As described above, the northwestern portion of the former CDE facility (comprising approximately 45 percent of the total facility acreage) was developed and contained the buildings that have since been demolished. The land in this northwestern portion was gently sloping, with pre-building demolition elevations ranging from 70 to 82 feet above mean sea level (msl).

The remaining 55 percent of the land area was undeveloped and predominantly vegetated. The central part of the undeveloped portion was primarily an open field, with some wooded areas to the south and a paved area in the middle. Topography dropped steeply to the northeast and southeast, and the eastern portion of the property consists primarily of wetlands bordering Bound Brook. Elevations range from approximately 71 feet above msl at the top of the bank to approximately 60 feet above msl along the Bound Brook (FWENC, 2001b).

1.3.2. Climate

The climate for Middlesex County is classified as temperate. Polar continental air masses control the region's winter weather and tropical air masses control summer weather. In

[2] ERT-7 was not constructed as a FLUTe™ well until September 2009; therefore, groundwater samples were not collected from ERT-7 in August 2008.

the summer these tropical air masses, largely originating over the Gulf of Mexico, travel about 1,000 miles over land before arriving in New Jersey. Although the heaviest rains are produced by coastal storms of tropical origin, a portion of the air masses originate from the Great Lakes. Prevailing winds are from the northwest from October through April, and from the southwest the remainder of the year.

In South Plainfield, the temperature ranges from an average of 29°F in January to 75°F in July, with an average annual temperature of about 53°F (FWENC, 2002). Summer temperatures occasionally exceed 100°F and temperatures in the middle to upper 80's (°F) occur frequently. Winter temperatures generally are not below 20°F for long time periods (FWENC, 2002). The average annual precipitation is approximately 49 inches. Precipitation occurs fairly evenly throughout the year.

1.3.3. Geology

The Site lies within the Piedmont Physiographic Province of New Jersey (Fenneman, 1938). The following contains a brief description of the surficial and bedrock geology of the Site. More extensive information is presented in the RI Report.

1.3.3.1. Surficial Geology

Quaternary and pre-Quaternary glacial and glacial-fluvial deposits overlie bedrock across much of the northern portion of New Jersey. Based on regional surficial geologic mapping for the area, unconsolidated deposits in the vicinity of the Site include sandy, silty clay to clayey, silty sand containing some shale, mudstone, and sandstone fragments. As shown on Figure 4-2 in the RI Report, these deposits are associated with recent alluvial and wetland (swamp and marsh) deposition and earlier glaciofluvial plain deposits. Extensive eolian (wind-driven) deposits are present to the west of the Site, derived from the earlier glaciofluvial plain deposits to the north and east of the Site. Surficial deposits underlying the Site are generally identified as regolith derived from weathering of shale, mudstone, and sandstone. The unconsolidated deposits are up to 30 feet thick regionally, but are generally less than 10 feet thick (FWENC, 2002) in the vicinity of the Site.

1.3.3.2. Bedrock Geology

The Site is located within the Newark Basin, which is a tectonic rift basin that covers roughly 7,500 square kilometers extending from southern New York through New Jersey and into southeastern Pennsylvania. The basin is filled with Triassic-Jurassic sedimentary and igneous rocks that are tilted, faulted, and locally folded.

The Passaic Formation (historically known as the Brunswick Formation) occupies an upper unit of the Newark Supergroup rocks in the Triassic-Jurassic Newark Basin and is the thickest and most aerially extensive unit in the Newark Basin. This formation consists of mostly red cyclical lacustrine clastics including mudstone, siltstone, and shale, with minor fluvial sandstone (Michalski and Britton, 1997). The reddish color originates from reworked hematite, which occurs in 5-10 percent of the unit. The Site is located immediately south of the contact between the Passaic Formation mudflat deposits, which are a thickly bedded mudstone, and the Passaic Formation, which is often thinly bedded sandstone and siltstone.

1.3.3.3. OU3 Geology

Unconsolidated deposits at the former CDE facility range in thickness from 0.5 to 15 feet and generally thicken to the east towards Bound Brook. Natural unconsolidated materials, consisting primarily of red-brown silt and sand with silt and clay layers, are generally intermixed with urban fill materials (including cinders, ash, brick, glass fragments, metal, and other detritus) throughout the former CDE facility and vicinity. A thin (surface to 15 feet bgs) layer of weathered bedrock overlies competent bedrock, consistent with the weathered bedrock identified by regional surficial geologic mapping. This material primarily consists of heavily weathered siltstone and shale material with a heterogeneous texture ranging from silt to fine sand, with some zones of angular, silty gravel and silty clay.

The top of competent bedrock underlying the former CDE facility ranges from 4 to 15 feet bgs, except in the northwestern portion of the facility where bedrock was present immediately beneath the building foundations. Based on boring log data for wells installed during the RI (See Appendix D in the RI Report), the bedrock at the Site consists primarily of red-brown to dark brown mudstone, siltstone, and shale consistent with the upper Passaic Formation. Boring logs from wells to the north of the former CDE facility are generally indicative of Passaic Formation mudstone facies, while cores from the former CDE facility and areas southwest and east of the facility show siltstone and shale. The bedrock units range from massive rock with few features to highly laminated beds. The bedrock units are consistently fine-grained in texture, with numerous calcified veins and vugs throughout. Bedrock associated with the older Lockatong and Stockton formations was not encountered in bedrock cores from OU3.

Bedrock boring logs and borehole acoustical televiewer data (See Appendix F in the RI Report) indicate that numerous fracture zones are present in the bedrock from the surface to approximately 600 feet bgs, the maximum drilled depth. The shallow bedrock units are heavily fractured and weathered, with significant shallow fracture in-filling with weathered material ranging in texture from silt/clay to sand. Shallow fractures are generally more open in the shallow bedrock and become less open with depth. The bedrock contains heavily fractured zones that occur along the bedding planes (parallel to sub-parallel). Weathered fracture zones within the bedrock ranged from near horizontal to near vertical. Pole to plane projections of the fracture data interpreted from the acoustical televiewer data (See Appendix F, Figure F-1 in the RI Report) show that the majority of these features are relatively low angle, ranging from 10 to 30 degrees from horizontal, consistent with the regional character of the Passaic Formation.

1.3.4. Hydrogeology

The following contains a brief description of the regional and OU3 hydrogeology. More extensive information is presented in the RI Report.

1.3.4.1. Regional Hydrogeology

The Passaic Formation generally forms a leaky multi-aquifer system that is hundreds of feet thick. Groundwater movement is primarily through bedding plane fractures and steeply dipping interconnected fractures and dissolution channels (secondary permeability). A very limited amount of groundwater flows through the interstitial pore spaces between silt or sand particles because of compaction and cementation of the formation (primary permeability). Differences in permeability between layers resulting from variations in fracturing and weathering may account for many water bearing units.

Groundwater in the Passaic Formation is often unconfined in the shallower, more weathered part of the aquifer; however silt and clay derived from the weathering process typically fill fractures, thereby reducing permeability. This relatively low permeability surface zone reportedly extends 50 to 60 feet bgs (Michalski, 1990). Groundwater in the deeper portion of the Passaic Formation is generally confined, as the lack of vertical fractures can create a confining effect with depth. Recharge is by leakage through fractures in the confining units. Local and regional groundwater discharge boundaries include surface water bodies like Bound Brook. However, municipal pumping centers (water wells) account for most of the regional groundwater discharge.

The Passaic Formation contains an aquifer that is used as a source of potable water for some of the communities surrounding the former CDE facility. Numerous private, industrial, and municipal wells tap the formation, with reported pumping rates that range from a few to several hundred gallons per minute. Current groundwater extraction influences regional and local groundwater movement, and the variable historical configuration and pumping of municipal extraction wells exerted a dominant influence on historical groundwater movement at the former CDE facility.

1.3.4.2. OU3 Hydrogeology

The bedrock aquifer in OU3 is separated into three hydrogeologic units or water bearing zones, identified as the "shallow", "intermediate", and "deep." They were separated into three water bearing zones based on the location of monitoring points (ports and screened intervals) for the creation of potentiometric surface maps and VOC distribution maps.

The shallow water bearing zone is unconfined and extends from the water table to a depth of approximately 120 feet bgs (bedrock). The water table fluctuates from the unconsolidated deposits due to seasonally high recharge and into the bedrock due to seasonally low recharge and the effects of nearby pumping. Therefore, groundwater encountered in the unconsolidated deposits is interpreted as part of the shallow unconfined bedrock aquifer. The upper few feet of the shallow water bearing zone is hydraulically connected to surface water bodies including Cedar Creek and Spring Lake. Groundwater to a depth of 120 feet bgs between MW-16 and ERT-3 has the potential to be hydraulically connected (discharging) to Bound Brook near the former CDE facility. The intermediate and deep water bearing zones, located below 120 feet bgs, are not hydraulically connected to surface water bodies.

The shallow water bearing zone is highly fractured. This is evidenced by the Theisian behavior of the aquifer (no fracture dewatering) in response to pumping during the Integrated Pumping Test (See Section 5.12, Appendix L of the RI Report). The intermediate and deep water bearing zones are also highly fractured; however, there is some evidence that the lack of horizontal and vertical fractures in some locations influence groundwater movement and creates a confining effect with depth (Michalski and Britton, 1997). Each of these water bearing units is described below.

Shallow Water Bearing Zone: The shallow water bearing zone is monitored by the uppermost port in each of the multi-port systems and the shallow bedrock wells constructed at the former CDE facility. An evaluation of current shallow bedrock groundwater levels compared to those collected during previous investigations indicate that current shallow bedrock aquifer water levels are approximately five feet higher than they were during the Foster Wheeler RI (FWENC, 2001b). The water level variations are interpreted to be the result of historical groundwater pumping near Spring Lake, which was gradually reduced and ultimately stopped in 2003.

Intermediate Water Bearing Zone: The intermediate water bearing zone marks the transition between the shallow and deep water bearing zones. This zone is monitored by the ports between 120 feet and 160 feet bgs in each of the multi-port systems. The fractures in the intermediate water bearing zone exhibit less in-filling with sediment and exhibit an increased permeability in individual fractures as compared to the shallow water bearing zone.

Deep Water Bearing Zone: The deep water bearing zone exhibits an increased permeability, due to fractures being more open with less in-filling of material due to weathering. This zone is monitored by the ports between 200 and 240 feet bgs in each multi-port system. This depth range was selected to characterize the deep water bearing zone because it has a dense network of ports, which facilitates data contouring and interpretation.

A plot of groundwater elevations collected in July 2010 from the shallow bedrock wells and the most shallow sampler port in each of the multi-port wells was used to characterize the shallow water bearing zone (See RI Report, Figure 4-8). The data show that the potentiometric surface is generally controlled by elevation, with groundwater in the shallow water bearing zone potentially discharging to Bound Brook, Cedar Brook, and Spring Lake. Groundwater in the shallow water bearing zone forms a mound at the former CDE facility, moving north and east from the facility toward Bound Brook, and northwest toward the low-lying area at the confluence of Bound Brook and Cedar Brook. Groundwater elevations in wells MW-19, MW-20, and MW-21 in the northwestern portion of OU3 reflect the influence of the Park Avenue wellfield. To the northeast of the former CDE facility, immediately across Bound Brook, groundwater movement in the shallow water bearing zone is generally toward the west.

A plot of groundwater elevations from multi-port sampler ports located between 120 and 160 feet bgs was used to characterize the intermediate water bearing zone (See RI Report, Figure 4-9). Groundwater movement in this zone is primarily to the north.

A plot of groundwater elevations from multi-port sampler ports between 200 and 240 feet bgs were used to characterize the deep water bearing zone (See RI Report, Figure 4-10). Groundwater movement in this zone is primarily to the north.

1.3.5. Demography and Land Use

The CDE Superfund Site is located in the Borough of South Plainfield in northern Middlesex County, New Jersey. The Site lies within a section of the Borough of South Plainfield that can be characterized as an urban area. As shown on Figure 1-4, land uses surrounding the former CDE facility are primarily commercial/light industrial to the northeast and east, residential to the south and north, and mixed residential/commercial to the west. The former CDE facility is currently zoned for commercial/industrial use.

According to the population estimates of the 2008 Census, the Borough of South Plainfield has a population of approximately 22,623 people. The 2006-2008 American Community Survey estimates that the approximate racial breakdown of South Plainfield's population includes White (68.4%), Black or African American (11.1%), Asian (13.4%), and other racial and ethnic groups (8.1%). Approximately 76.8% of the population of the Borough of South Plainfield are between the ages of 18 and 65, 9.7% are between the ages of 1 and 18, and 13.5% are 65 years or older. The median household income was $91,555 in 2008 and the percentage of the population of the Borough of South Plainfield at or below the poverty level was 5.3% (census.gov).

The area within 1.5 miles of the former CDE facility contains eight schools and five parks. Two elementary schools are located approximately 2,000 feet from the former CDE facility (one to the north and the other to the south).

1.4. Baseline Human Health Risk Assessment Overview

This BHHRA is an evaluation of potential human health risks associated with chemicals detected in groundwater. The BHHRA follows the four-step process typically used to assess potential human health risks (USEPA, 1989; NRC, 1983). The four steps are:

Data Evaluation: Relevant groundwater data are compiled and analyzed to determine the usability of the data and to select chemicals of potential concern (COPC) in groundwater.

Exposure Assessment: Actual and/or potential chemical release and transport mechanisms are identified, potentially-exposed human populations and possible exposure pathways are described, concentrations of COPCs at potential points of human exposure are determined, and human exposures to the COPCs are estimated.

Toxicity Assessment: Qualitative and quantitative toxicity information for each COPC are summarized and toxicity values used to characterize risks are identified.

Risk Characterization: The likelihood and magnitude of adverse health effects, in the form of non-cancer hazard quotients and incremental lifetime cancer risks, are estimated. Sources of uncertainty in the BHHRA are noted and discussed.

2. Data Evaluation

The data evaluation focuses on the compilation of usable chemical data and the selection of COPCs in groundwater. The data described below were used to calculate representative chemical concentrations to which humans may be exposed, through the pathways described in RAGS Part D Table 1 (see Appendix A). While historical data from previous OU3 investigations are summarized herein, they were not included in the quantitative assessment of human health risks.

Groundwater samples are available from the twelve shallow bedrock wells and eight deep bedrock wells[3] discussed in Section 1.2, in addition to thirteen deep bedrock wells (MW-13, MW-14S, MW-14D, MW-15S, MW-15D, and MW-16 through MW-23) installed as FLUTe™ wells from January 2009 to December 2010 and a former production well (FPW) that was discovered during field investigations and converted to a FLUTe™ well in October 2009. Table 2-1 lists the groundwater monitoring wells and screened interval for each shallow bedrock well or FLUTe™ well sampler port. In general, groundwater samples were collected from between two and nine discrete depth intervals in each FLUTe™ well. Figure 2-1 depicts the location of each groundwater monitoring well on the Site.

Groundwater samples were collected from all wells in October 2009 and March-April 2010 and were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, metals (including mercury), and cyanide. Groundwater samples were collected from a subset of 24 wells in March-April 2010 and July 2010 for PCB congener and dioxin/furan analyses. The 24 shallow bedrock wells or FLUTe™ well sampler ports from which samples for PCB congener and dioxin/furan analyses were collected are noted on Table 2-1. Generally, selection of the individual wells/ports for PCB congener and dioxin/furan analyses was based on the positive (i.e., detected) concentrations of PCB Aroclors in groundwater samples from October 2009 and the relative spatial distribution (horizontal and vertical) of the wells/ports selected for analysis. In December 2010 and March 2011, groundwater samples were collected from only the newly-installed MW-23 and were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, metals (including mercury), and cyanide.

[3] ERT-7 was converted into a FLUTe™ well in September 2009.

2.1. Data Usability

Table 2-2 presents a summary of analytical methods and data validation performed for the groundwater samples described above. As indicated, the samples were analyzed by USEPA Contract Laboratory Program (CLP) statements of work. The analytical data were validated by the USEPA, Region 2 Hazardous Waste Support Branch. Generally, the data characteristics used to satisfy the quality assurance/quality control requirements included precision, accuracy, representativeness, comparability, detection limit verification, and blank contamination elimination or qualification. Based on review of the available data validation reports, the majority of the groundwater data is of acceptable quality overall but subject to the data validator's qualifying remarks.

Following review of the validated PCB congener data from samples collected in March-April 2010 and July 2010, it was decided not to use the March-April 2010 PCB congener data from MW-11 in this BHHRA. These data were qualified by the USEPA data validator as non-detect at elevated reporting limits due to method blank and equipment rinseate blank contamination.[4] Therefore, it was decided to use only the July 2010 PCB congener data from MW-11. In addition, because the PCB congener data are evaluated on the basis of their toxicity relative to that of 2,3,7,8-tetrachlorodibenzo(p)dioxin (2,3,7,8-TCDD) and factor into the calculation of 2,3,7,8-TCDD toxic equivalence (termed 2,3,7,8-TCDD TEQ), the March-April 2010 dioxin/furan data from MW-11 also were not used in this BHHRA.

Given the relatively elevated concentrations of some chemicals detected in groundwater samples from monitoring wells on the former CDE facility, an evaluation of reporting limits for non-detected chemicals was carried out. This was completed to address concerns that the laboratory analysis of chemicals present at elevated concentrations (specifically the peaks of these chemicals and dilutions performed to bring them within the calibration range) may have masked the presence and affect interpretation of the distribution of other chemicals in groundwater.

Table 2-3 presents the range of reporting limits for chemicals qualified as non-detect. The maximum reporting limits are compared to the chemical-specific USEPA Regional Screening Levels (RSL) for tapwater (USEPA, 2011a), where available, which are the

[4] The MW-11 samples collected from the same depth intervals in July 2010 revealed positive concentrations. For more information on the review of the PCB congener data, refer to the Draft RI Report Appendix K.3, Cornell-Dubilier OU3 Groundwater Event 2 Quality Control Summary Report.

screening toxicity values used to identify COPCs in this BHHRA. The RSLs are based on either a target non-cancer hazard quotient (HQ) of 0.1 or a target cancer risk of one-in-a-million (10^{-6}). A range of human health risk-based screening values is also presented, consistent with the evaluation of reference limits presented in Worksheet #15 of the Quality Assurance and Project Plan (QAPP) for OU-3 (Malcolm Pirnie, 2008a). For RSLs based on non-cancer health effects, the range of screening values is based on a target non-cancer HQ of 0.1 and 1. For the cancer risk-based RSLs, the range of screening values is based on a target cancer risk level of 10^{-6} and 10^{-4}.

As shown in Table 2-3, the maximum reporting limit for some chemicals exceeds the corresponding USEPA RSL for tapwater. For VOCs, PCB Aroclors, and pesticides, the reporting limits are consistently greater than the RSLs, even where the RSLs are alternatively presented on an HQ basis of 1 or cancer risk basis of 10^{-4}. The reporting limits for approximately half of the non-detected SVOCs do not exceed the RSLs, and where the reporting limit is greater than the RSL based on either an HQ of 0.1 or target cancer risk of 10^{-6}, most are within the range of risk-based screening levels presented. Given this evaluation, it is possible that elevated detection limits may have masked the presence of individual VOCs, PCB Aroclors, and pesticides. However, it is not likely that this source of uncertainty will affect the RI/FS conclusions.

2.2. Historical Groundwater Data Evaluation

Historical groundwater data were not used in the quantitative assessment of human health risks. However, they were evaluated by comparing maximum detected concentrations to USEPA RSLs for tapwater.

Appendix B, Table B-1 lists the shallow, unconsolidated groundwater samples (referred to as "shallow bedrock groundwater," "test pit seep," and "perched groundwater") collected by Foster Wheeler from June to October 2000. As shown, shallow bedrock groundwater samples are from the twelve monitoring wells (MW-01A, MW-02A, and MW-03 through MW-12) and "former Production Well Number 3" (two depths, shallow and deep) located at the former CDE facility. Groundwater samples from all wells were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, metals, and cyanide. Samples from MW04, MW09, and MW11 were also analyzed for PCB congeners and dioxins/furans. A summary of Foster Wheeler's shallow bedrock groundwater data is presented in Appendix B, Table B-2. Results of duplicate samples collected from MW11 were averaged with those of the corresponding originals.

A summary of Foster Wheeler's test pit seep and perched groundwater data is presented in Appendix B, Table B-3. Groundwater encountered during excavation of the test pits was sampled using a clean glass bottle clipped to a steel pole or attached to a wire line (FWENC, 2001b). These groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, metals, and cyanide. Groundwater encountered during drilling of the monitoring well boreholes for MW-01 through MW-12 was collected using a disposable polyethylene bailer through hollow stem augers, and samples were analyzed for VOCs and PCB Aroclors (FWENC, 2001b).

A summary of the shallow and deep bedrock groundwater data collected by the USEPA in 2008 is presented in Appendix B, Table B-4. As described in Section 1.2, the USEPA collected groundwater samples from seven FLUTe™ wells and twelve shallow bedrock monitoring wells. Groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCB Aroclors, and metals. In Table B-4, results of duplicate samples were averaged with those of the corresponding originals.

The list of VOCs, SVOCs, pesticides, PCB Aroclors, and metals detected in historical groundwater samples from the former CDE facility is consistent with those detected in groundwater samples collected across the Site during this RI. The chemicals that would be identified as COPCs based on comparison to the USEPA RSLs for tapwater is also similar to the list of COPCs identified using the more recent groundwater data. Therefore, the potential for adverse health effects from exposure to the chemicals detected in historical groundwater samples was addressed by the quantitative evaluation presented in this BHHRA.

2.3. Groundwater Exposure Units

As described in OU3 Hydrogeology (Section 1.3.4.2), the bedrock aquifer was divided into "shallow," "intermediate," and "deep" water bearing zones to describe the hydrogeology and distribution of contamination. The shallow bedrock aquifer is unconfined, and groundwater movement is generally controlled by elevation, with evidence of potential shallow groundwater discharge to Bound Brook. Groundwater movement in the intermediate and deep water bearing zones is primarily to the north. These zones do not exhibit evidence of potential groundwater-surface water interaction.

Consistent with this conceptual understanding of OU3 hydrogeology and to facilitate evaluation of the potential for human exposure through the pathways described in RAGS Part D Table 1, multiple groundwater exposure units were established for this BHHRA. The first exposure unit consists of the entire aquifer. A second exposure unit consists of only shallow groundwater, generally defined as groundwater from the shallow bedrock monitoring wells and the most shallow sampler port in each of the FLUTe™ multi-port wells. Shallow groundwater was further separated into onsite[5] and offsite exposure units, because relatively higher chemical concentrations were detected in groundwater samples from the onsite monitoring wells. Lastly, because there is evidence of potential shallow groundwater discharge to Bound Brook, offsite groundwater was further separated into two exposure units relative to (i.e., north or south of) Bound Brook.

In summary, the following groundwater exposure units were established for the purposes of this BHHRA:

- Entire aquifer – includes groundwater data from all wells and across all sample depths. However, groundwater data from ERT-8 was not included, because it is an upgradient well that defines the southern edge of groundwater contamination associated with the former CDE facility and as such, is considered representative of background conditions.

- Shallow onsite groundwater data – includes groundwater data from the shallow bedrock monitoring wells and the most shallow sampler port in each multi-port well located within the former CDE facility property boundary.

- Shallow offsite groundwater data, south of Bound Brook – includes groundwater data from the most shallow sampler port in each of the multi-port wells located outside the former CDE facility property boundary and south of Bound Brook. Groundwater data from ERT-8 were not included, because it is an upgradient well that defines the southern edge of groundwater contamination associated with the former CDE facility and as such, is considered representative of background conditions.

- Shallow offsite groundwater data, north of Bound Brook – includes groundwater data from the most shallow sampler port in each of the multi-port wells located outside the former CDE facility property boundary and north of Bound Brook.

Table 2-4 lists the monitoring wells included in each of the three shallow groundwater data sets. The locations of wells included in each shallow groundwater exposure unit are

[5] In this case and throughout the BHHRA, "onsite" and "offsite" refer to locations relative to the property boundary of the former CDE facility.

shown on Figure 2-2 (shallow onsite monitoring wells), Figure 2-3 (shallow offsite, south of Bound Brook), and Figure 2-4 (shallow offsite, north of Bound Brook).

The entire aquifer was considered a single exposure unit, due to the nature of potential commercial/industrial and residential exposure to groundwater (e.g., through ingestion of potable water drawn from a private or municipal supply well). Shallow groundwater was separated into these three exposure units, to evaluate the potential exposure of a particular receptor population (i.e., construction/utility workers) that is not expected to also be exposed to groundwater at depth.

Based on the direction of groundwater flow, as shown on potentiometric surface maps, and on the current understanding of the historical pumping of nearby wellfields, the RI Report presents lines of evidence suggesting the former CDE facility is not the source of impacts in monitoring wells ERT-5, ERT-6, and MW-18 (located within the Pitt Street Well Contamination Area, west of the former CDE facility). However, the results are not conclusive. Therefore, these wells were included in the “entire aquifer” and “shallow offsite groundwater, south of Bound Brook” data sets evaluated in this BHHRA. To determine the contribution that groundwater data from these wells make to the baseline cancer risks and non-cancer hazards, a separate evaluation of the groundwater data from only ERT-5, ERT-6 and MW-18 is presented in the Uncertainty Evaluation.

2.4. Selection of COPCs in Groundwater

To focus the BHHRA on those chemicals that, if contacted, have the greatest potential to pose human health risks, the list of detected chemicals in each groundwater exposure unit was narrowed to a list of COPCs, according to the following screening process:

- Chemicals designated by the USEPA as Class A or known human carcinogens were identified as COPCs regardless of the other selection criteria. The following chemicals in groundwater are Class A carcinogens: benzene, vinyl chloride, arsenic, and chromium VI (used as a conservative screen for total chromium sample results).

- Detected chemical concentrations were compared to the USEPA RSLs for tapwater (USEPA, 2011a). The RSLs for tapwater are protective of chronic exposures via ingestion and inhalation (of volatile chemicals only) routes; exposure via dermal contact was not included in the derivation of RSLs for tapwater. The RSLs are based on a target cancer risk of 10^{-6} or a target non-cancer HQ of 1. Consistent with USEPA, Region 2 guidance for screening sites with multiple contaminants, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Chemicals with maximum concentrations greater than the screening levels were identified as COPCs.

- The essential nutrients (i.e., calcium, magnesium, potassium, and sodium) were categorically eliminated as COPCs.

- Finally, following USEPA (1989) guidance, for sample sizes greater than or equal to 20, if the detection frequency of a chemical was less than 5% and chemical contamination was not biased toward any given area and was not believed to be site-related, it was eliminated as a COPC.

The OU3 groundwater data summaries and selection of COPCs in each exposure unit are presented in RAGS Part D Tables 2.1 to 2.4 (see Appendix A). The range of detected concentrations, data qualifiers, location of maximum detected concentration, frequency of detection, range of detection limits, concentration used for screening, screening toxicity value (i.e., USEPA RSL), COPC flag, and the rationale for elimination or selection of a chemical as a COPC are provided. Background values presented in RAGS Part D Table 2s are detected concentrations in ERT-8. The background values and potential ARARs/TBCs (Applicable or Relevant and Appropriate Requirements/To Be Considered) were presented for information purposes only. The groundwater COPCs that were evaluated in this BHHRA are summarized by exposure unit in Table 2-5.

A few of the detected chemicals did not have RSLs. With few exceptions, chemicals without RSLs were retained as COPCs; they were only eliminated as COPCs where they were infrequently detected (as defined above).

RSLs were not available for PCB congeners and were only available for two individual dioxin/furan congeners: 2,3,7,8-TCDD and 1,2,3,6,7,8-hexachlorodibenzo-p-dioxin (HxCDD). Rather than evaluating each PCB congener and dioxin/furan congener separately, the current practice recommended by the USEPA (2010b) is to assess mixtures of dioxins/furans and PCBs that exhibit dioxin-like toxicity on the basis of their predicted toxicities relative to what is known about the toxicity of 2,3,7,8-TCDD. Twelve PCB congeners and seventeen dioxin/furan congeners have been assigned 2,3,7,8-TCDD toxic equivalence factors (TEF) according to the 2005 World Health Organization (WHO) TEQ weighting scheme (USEPA, 2010b). Within a sample, detected PCB congener and dioxin/furan congener concentrations were multiplied by the congener-specific TEF, and the sum of the adjusted concentrations was calculated as 2,3,7,8-TCDD

TEQ. For this reason, the groundwater data tables (i.e., RAGS Part D Table 2s) present a summary of PCB congeners and dioxin/furans on a 2,3,7,8-TCDD TEQ basis. The toxicity values used to evaluate the potential for human health risk were specific to 2,3,7,8-TCDD.

While the RAGS Part D Table 2s present summaries for the individual PCB Aroclor mixtures (e.g., Aroclor 1248) detected in groundwater, the sum of detected PCB Aroclor concentrations within a sample was calculated and used in the human exposure calculations. The toxicity values used to evaluate the potential for human health risk were specific to Aroclor 1254 or total PCBs, as available.

3. Exposure Assessment

The objective of the exposure assessment is to estimate the type and magnitude of human exposure to the COPCs in groundwater. The human exposure scenarios evaluated in this BHHRA are based on the anticipated future commercial/industrial use of the former CDE facility and the current and most likely future land uses at the Site, as described in Section 1.3.5.

In addition, a well search for a 1-mile radius of the former CDE facility was performed in October 2009 by the NJDEP Bureau of Water Systems and Well Permitting. Wells for commercial, domestic, irrigation, industrial, public non-community, and public supply uses are located within 1 mile of the former CDE facility. Figure 3-1 shows the locations of these wells relative to the OU3 groundwater monitoring wells on the Site.

3.1. Chemical Release and Transport Mechanisms

As described previously, CDE disposed of PCB-contaminated materials and other hazardous substances directly on facility soils. Therefore, facility soils are considered the primary source of contamination at the Site. Secondary release mechanisms that can facilitate the migration of chemicals include infiltration and percolation through soils to groundwater, vapor emissions to indoor and outdoor air, and potential groundwater migration/discharge to surface water and sediment of nearby wetlands and surface water bodies (e.g., Bound Brook).

3.2. Potential Exposure Pathways and Potentially-Exposed Populations

This BHHRA focuses on groundwater as a secondary source of contamination. Evaluation of the groundwater pathway considers the following:

- The potential for contact with dissolved chemicals during either potable or non-potable use of the groundwater in or on residential, commercial/industrial, and other properties throughout the Site.

- Vapor emissions to outdoor air on properties throughout the Site. This may occur following passive diffusion of volatile chemicals from groundwater through the bedrock and overburden materials to outdoor ambient air, or from volatilization off of pooled groundwater surfaces exposed to ambient air, such as in a utility trench or other excavation. Due to the uncertainties associated with quantitatively modeling ambient air concentrations following volatilization from groundwater that may include DNAPL in fractured bedrock, the pathway by which volatile chemicals migrate through the bedrock and overburden to outdoor ambient air was qualitatively evaluated. The latter pathway by which volatile chemicals may be released from groundwater that pools at the bottom of an excavation was quantitatively evaluated.

Generally, the exposure concern with potable use of groundwater is the potential for ingestion of chemicals detected in the groundwater and inhalation of and dermal contact with chemicals in the groundwater during routine household uses (e.g., bathing, cleaning). Non-potable use of the groundwater may be for sanitary, process, irrigation, or other non-consumptive purposes. The exposure concern with non-potable use of the groundwater is the potential for dermal contact with and inhalation of chemicals in the groundwater.

The potential for adverse health effects from inhalation exposure to volatile chemicals that may migrate from groundwater to indoor air through cracks in building foundations was not evaluated in this BHHRA. This exposure pathway is being addressed by the USEPA, separate from this RI. In addition, the potential for exposure to chemicals in groundwater that migrates to surface water and sediment of Bound Brook was not evaluated in this BHHRA. These exposure pathways will be addressed during the RI for OU4.

The potential for exposure was evaluated for a number of current and future scenarios outlined in RAGS Part D Table 1 (see Appendix A). The scenario time frame, medium, exposure medium, exposure point, receptor population, receptor age, exposure route, type of analysis and rationale for selection or exclusion of an exposure pathway are provided.

The following receptor populations may be exposed to COPCs in groundwater:

Current/Future Scenario

Commercial/Industrial Workers: (adults) who perform work within and outside the boundaries of the former CDE facility. Based on the well search, potable, sanitary, and/or process use of groundwater is possible. Potential exposure pathways and routes of exposure for commercial/industrial workers are dermal contact and inhalation of chemicals in groundwater.[6] In addition, exposure to volatile chemicals that migrate from groundwater to outdoor air may occur.

- Residents: (adults) who may live outside the boundaries but within the vicinity of the former CDE facility. Based on the well search, potable use of groundwater is possible. Potential exposure pathways and routes of exposure for adult residents include ingestion, dermal contact, and inhalation of chemicals in groundwater. In addition, exposure to volatile chemicals that migrate from groundwater to outdoor air may occur.

- Residents: (children, aged 0-6 years) who may live outside the boundaries but within the vicinity of the former CDE facility. Based on the well search, potable use of groundwater is possible. Potential exposure pathways and routes of exposure for child residents include ingestion, dermal contact, and inhalation of chemicals in groundwater. In addition, exposure to volatile chemicals that migrate from groundwater to outdoor air may occur.

- Construction/Utility Workers: (adults) who may perform short-term intrusive work for construction or utility installation, maintenance, or repair. Construction/utility workers may be exposed to chemicals in shallow groundwater encountered during subsurface excavations. Depths of perched water zones encountered by Foster Wheeler were variable across the former CDE facility, but they typically occurred in the range of 4 to 8 feet bgs. Potential exposure pathways and routes of exposure include dermal contact with chemicals in groundwater (e.g., that infiltrates and pools at the bottom of an excavated trench) and inhalation of volatile chemicals that may migrate from pooled groundwater to outdoor air above an excavation. In addition, exposure to volatile chemicals that migrate from groundwater to outdoor air may occur.

3.3. Data Utilization

In utilizing the analytical data to derive representative EPCs to which humans may be exposed, analytical results of duplicate samples were averaged with those of the corresponding originals. In calculating the arithmetic average of original and duplicate

[6] The potential exposure of commercial/industrial workers through ingestion of potable groundwater was not evaluated in this BHHRA. Due to the greater frequency and duration of exposure, evaluation of ingestion exposures to resident adults and children is considered protective of commercial/industrial workers as well.

samples, if a COPC was present in one sample but non-detect in the other, the COPC was assumed to be present in the non-detect sample at a concentration equivalent to one-half the sample reporting limit. Data assigned a qualifier, indicating that the numerical value is an estimated quantity or that the identity and quantity are based on presumptive evidence, were treated the same way as data without such qualifiers.

3.3.1. COPC Concentrations in Groundwater

Representative EPCs were calculated from the available/useable groundwater data sets described above. To evaluate the exposure of commercial/industrial workers and resident adults and children, EPCs were derived using the entire aquifer data set, assuming that groundwater from across the Site is in communication. This approach may overestimate exposure to resident adults and children, because residential exposure to potable groundwater is not expected to occur inside the former CDE facility boundaries.[7] To evaluate the exposure of construction/utility workers, EPCs were derived for each of the three shallow groundwater data sets.

The USEPA (1992a, 1989) recommends that the arithmetic average concentration of the data be used for evaluating long-term exposure and that, because of the uncertainty associated with estimating the true average concentration at a site, the 95% upper confidence limit (UCL) on the arithmetic average be used as the EPC. The 95% UCL concentration provides reasonable confidence that the true average will not be underestimated. The USEPA also indicates that where there is a question about the distribution of the data, a statistical test should be used to identify the best distributional assumption for the data set (USEPA, 1992a).

The ProUCL® 4.1.00 (ProUCL) program developed by the USEPA's Technology Support Center for Monitoring and Site Characterization was used to plot the data, test the distributional assumptions, and calculate 95% UCL concentrations. When entering data into ProUCL, if a COPC was not detected in a sample, the sample reporting limit was entered as a proxy concentration and the sample result was coded as non-detect. ProUCL contains rigorous parametric and nonparametric statistical methods that can be

[7] Groundwater data from only the onsite monitoring wells, across all depths, was not quantitatively evaluated as a separate "entire aquifer" exposure unit in this BHHRA. While chemicals were detected at relatively elevated concentrations in the onsite vs. offsite monitoring wells, and there is the potential for future potable use of groundwater within the former CDE facility boundaries (however unlikely), it was assumed detected concentrations are elevated enough that the potential for human health risks is evident without quantifying exposure and risk. To illustrate, groundwater data from only the onsite wells, across all depths, were summarized and presented in Appendix C.

used on full or uncensored data sets and on data sets with below detection limit observations (also called left-censored data sets). Depending on the distribution and 95% UCL estimation method, ProUCL will use only detected data or will incorporate detection limits (USEPA, 2010a). In instances where the 95% UCL concentration calculated by ProUCL was greater than the maximum detected concentration (e.g., 2,3,7,8-TCDD TEQ in the shallow onsite groundwater data set), the maximum concentration was retained as the EPC.

In addition, the USEPA (2010a) indicates that statistical estimates of EPCs may not be reliable for data sets having a large percentage of non-detects. For data sets with a high percentage of non-detects, the EPC may instead be estimated using simple ad hoc methods (e.g., using the median or mode). Consistent with USEPA guidance, statistical estimates of EPCs were not made for data sets with greater than 70% non-detects. However, rather than using the median or mode, the maximum detected concentration was retained as the EPC.

The EPCs for the COPCs in groundwater are presented in RAGS Part D Tables 3.1 to 3.4 (see Appendix A). The ProUCL output sheets (i.e., box plots and UCL concentrations) for the individual COPCs are provided in Appendix D.

Evaluation of the box plots indicated the presence of potential upper-end statistical outliers (either relatively elevated concentrations or sample reporting limits) in a number of groundwater data sets. These potential outliers were not removed from the data sets used to calculate EPCs.[8] However, it was further observed that pesticides and PCB Aroclors (1248, 1254) were detected in a few samples at concentrations greater than their aqueous solubility limits. These chemicals may be present in those particular samples as non-aqueous phase liquid (NAPL) or may be solubilized by the presence of other chemicals.[9] As noted in the RI Report for OU2, some degree of cosolvent-enhanced

[8] The majority of relatively elevated chemical concentrations were detected in a few wells located within the former CDE facility boundary. These concentrations were included in the entire aquifer and shallow groundwater data sets used to calculate baseline cancer risks and non-cancer hazards representative of exposure across the Site. This is a conservative evaluation, as the RI Report established the majority of aqueous mass has diffused into the rock matrix, and that ongoing attenuation processes will likely limit additional aqueous mass redistribution. To determine the relative contribution the elevated concentrations have to the baseline cancer risks and non-cancer hazards (and thereby better approximate cancer risks and non-cancer hazards from exposure to groundwater outside the former CDE facility property boundary), an alternate evaluation that excludes data from a few onsite monitoring wells is presented in Section 5.2, Discussion of Cancer Risks and Non-cancer Hazards.

[9] As indicated in Section 5.5.1 of the RI Report, the presence of NAPL in MW-14, at the very least, was indicated by the reactive liner and groundwater sample results.

solubility or mobility of pesticides (and other hydrophobic compounds like PCBs and dioxins) may occur due to the presence of chlorinated VOCs (FWENC, 2002). Therefore, the pesticide and total PCB Aroclor concentrations greater than aqueous solubility were selectively removed from the applicable groundwater data sets before EPCs were calculated. The following table summarizes information on the pesticide and total PCB Aroclor concentrations removed, aqueous solubility limits, particular samples, and affected groundwater data sets.

	Aqueous Solubility Limit *	October 2009	March/April 2010		
		MW-14S-04	MW-11	MW-14S-02	MW-14S-04
gamma-Chlordane	56 (a)	Not Detected	--	--	370
4,4'-DDD	90 (b)	1,800	R	R	R
4,4'-DDE	120 (b)	1,600	--	--	260
4,4'-DDT	25 (b)	4,000	36	--	840
Heptachlor	180 (b)	300	--	--	--
Aroclor 1248	100 (a)	7,300	Not Detected	Not Detected	Not Detected
Aroclor 1254	43 (a)	5,600	190	71	--
Total PCB Aroclors	Not Available	12,900	190	101	--
	Affected data set:	Entire Aquifer	Entire Aquifer; Shallow Onsite	Entire Aquifer	Entire Aquifer

Notes:

Concentration units are μg/L.

-- Indicates chemical was detected but at concentration less than aqueous solubility.

R - Indicates sample result was rejected by data validator.

*Sources of aqueous solubility limits are (a) USDOE, 2011 and (b) USEPA, 1996.

Similarly, further evaluation of the PCB congener data revealed concentrations that are also likely greater than aqueous solubility and therefore may indicate the presence of a NAPL or that some cosolvency is occurring. Total detected PCB congener concentrations were calculated and compared to the solubility limit for Aroclor 1254 (i.e., 43 μg/L). Where total detected PCB congener concentrations were greater than aqueous solubility, the corresponding 2,3,7,8-TCDD TEQ concentrations were selectively removed from the applicable groundwater data sets before EPCs were calculated. The following table summarizes information on the total detected PCB congener concentrations, corresponding 2,3,7,8-TCDD TEQ concentrations removed, particular samples, and affected groundwater data sets.

	Aqueous Solubility Limit *	March/April 2010		July 2010		
		MW-12	MW-14S-04	MW-11	MW-12	MW-14S-04
Total PCB Congeners	43	1,504	67,666	321	222	80,753
2,3,7,8-TCDD TEQ	Not Available	5.0E-04	2.1E-01	8.4E-04	1.0E-04	2.2E-01
	Affected data set:	Entire Aquifer; Shallow Onsite	Entire Aquifer	Entire Aquifer; Shallow Onsite Groundwater		Entire Aquifer

Notes:

Concentration units are µg/L.

*USDOE, 2011

This approach was adopted in an effort to more accurately characterize the potential for cancer risk and non-cancer hazard across the Site. The relatively elevated pesticide and PCB concentrations that were selectively removed from the entire aquifer data set do not represent conditions throughout OU3. The elevated concentrations of pesticides and PCBs detected in the onsite monitoring wells are not likely migrating outside the boundary of the former CDE facility, and to include them in the entire aquifer data set would unreasonably bias the cancer risks and non-cancer hazards high. In addition, it is possible the laboratory analysis of pesticides was influenced by elevated PCB concentrations in the groundwater samples and that some observed concentrations are false positive results.

3.3.2. COPC Concentrations in Air

The EPCs for the volatile COPCs in outdoor or indoor air following release from groundwater were estimated based on the EPCs for those COPCs in groundwater. The various techniques used to estimate COPC emissions and concentrations are presented in Appendix E and summarized below.

Concentrations of the volatile COPCs in outdoor air (to evaluate potential exposure of construction/utility workers) were estimated using an emissions equation recommended by the USEPA (1995b), under the assumption that shallow groundwater infiltrates an excavation and volatile COPCs are released from pooled water at the bottom of the excavation, and the USEPA-approved Point, Area, and Line source (PAL2.1) model (USEPA, 1992b).[10] As the depth to groundwater in some areas of the Site is greater than the depth a hypothetical utility trench would be, scenarios where volatile COPCs could be released from the water table and diffuse through the overlying soil before infiltrating an excavation are possible. However, evaluation of the pooled water scenario should be adequately protective of deeper water table conditions. As such, deeper water table conditions were not evaluated further.

Concentrations of the volatile COPCs in bathroom air during and after showering (to evaluate potential exposure of resident adults and children) were estimated using the "Schaum model" (Schaum et al., 1992). A modified version of the Schaum model was used to estimate concentrations of the volatile COPCs in air following emissions from process water (to evaluate potential exposure of commercial/industrial workers). The exposure scenario assumed workers may use groundwater for process/industrial activities (e.g., to wash vehicles or equipment) and volatile COPCs are emitted from the water to ambient air within a closed environment (i.e., building).

3.4. Estimates of Chemical Intake/Exposure

Estimates of chemical intake and exposure were developed to portray reasonable maximum exposure (RME) under current and future exposure scenarios. The RME scenario considers the highest exposure that might reasonably be expected to occur, one that is well above the average case of exposure but within the range of possibility. Use of RME parameter values to model baseline human health risks is a conservative approach, in that it yields upper bound cancer risk and non-cancer hazard estimates (USEPA, 1989). In accordance with USEPA Region 2 guidance, if risks in excess of USEPA acceptable levels were determined for an exposure pathway, the pathway was then re-evaluated using central tendency exposure (CTE) parameter values, where applicable, in place of upper-bound values specific to the RME analysis (USEPA, 1995a).

[10] Newer air models that allow for a more site-specific assessment of chemical emissions were made available in April 2010 (http://www.epa.gov/ttn/scram/dispersion_screening.htm#aerscreen). These models incorporate information on land use and surface characteristics specific to a site. It is unknown whether volatile chemical concentrations in air predicted by the new models would be generally greater or less than those predicted using the approach described in Appendix E. However, the air models used in this BHHRA should be sufficiently conservative for risk screening purposes.

3.4.1. Exposure Equations

The equations used to estimate human exposure are presented in RAGS Part D Tables 4.1 to 4.7 (see Appendix A). For commercial/industrial workers and residents, chronic exposures were estimated. For construction/utility workers, where the exposure duration (ED) is assumed to be one year, subchronic exposures were estimated.

3.4.1.1. Oral and Dermal Exposures

Application of the exposure equations results in daily intake for assessing oral exposure or dermally absorbed dose (DAD) for dermal contact exposure, both of which are expressed in milligrams per kilogram of body weight per day (mg/kg-day). The daily intake is the amount of chemical at the exchange boundary. A fundamental assumption in the estimate of the DAD is that absorption continues long after the exposure has ended (USEPA, 2004). Thus, the dermally absorbed dose per event (DA_{event}) is the total dose dissolved in the skin at the end of the exposure.

The exposure equations require a chemical concentration or the average concentration contacted over the exposure period (e.g., µg/L groundwater). In this BHHRA, this is the 95% UCL concentration, where applicable, or maximum detected concentration. The equations also require a contact rate (i.e., the amount of contaminated medium contacted per unit time or event), a body weight (i.e., the average body weight over the exposure period), and an averaging time (i.e., the time period over which exposure is averaged).

The averaging time (AT) depends on the type of toxic effect being assessed. When evaluating exposures for potential non-cancer health effects, intakes and dermally absorbed doses were calculated by averaging over the period of exposure. This is equivalent to the receptor-specific ED, described below, multiplied by 365 days/year. When evaluating potential cancer risks, intakes and dermally absorbed doses were calculated by prorating the total cumulative intake over a lifetime (i.e., lifetime average daily intake). For calculation purposes, this is equal to 70 years multiplied by 365 days/year (25,500 days). This distinction is consistent with the hypothesis that the mechanism of action for each of these health effects endpoints is different. The approach for carcinogens is based on the assumption that a high dose received over a short period of time is equivalent to a corresponding low dose spread over a lifetime.

3.4.1.2. Inhalation Exposure

Application of the equation for estimating inhalation exposure (USEPA, 2009a) results in the exposure concentration (EC), which is expressed in micrograms per cubic meter

($\mu g/m^3$) and is based on the EPC for each COPC in air. The EPCs were modified to account for receptor-specific exposure parameters [e.g., ED, exposure frequency (EF), and exposure time (ET)] but do not consider receptor-specific body weight or inhalation rate. This approach is different from that used to evaluate oral and dermal exposures in that the EC, rather than chemical intake, is the metric used to estimate risk. The USEPA believes "the amount of the chemical that reaches the target site is not a simple function of inhalation rate and body weight" but "is affected by factors such as species-specific relationships of exposure concentrations to deposited/delivered doses and physiochemical characteristics of the inhaled contaminant" (USEPA, 2009a). The inhalation toxicity values used to assess both cancer risk and non-cancer hazard are derived from human equivalent concentrations extrapolated from experimental exposures.

The AT in the inhalation exposure equation is expressed in hours. Therefore, for evaluating potential cancer risks, the AT equals 613,200 hours (25,550 days x 24 hours/day). The AT for non-cancer health effects is equivalent to the receptor-specific ED (in years) multiplied by 365 days/year and 24 hours/day. Where the ED is much less than 1 year (e.g., for the construction/utility worker), the AT is calculated as ED (in days) x 24 hours/day (USEPA, 2009a).

3.4.2. Receptor-Specific Exposure Parameters

The exposure parameters used to model human exposure to the COPCs in groundwater under the RME scenario are described in the following sections and presented in RAGS Part D Tables 4.1.RME to 4.7.RME. A number of exposure parameter values were modified for use in the CTE evaluations, as presented in RAGS Part D Tables 4.1.CTE to 4.7.CTE. Some of these modified values (e.g., ED) are referenced to USEPA guidance, while others (e.g., EF) are based on professional judgment.

3.4.2.1. Commercial/Industrial Workers

The exposure parameters used to model commercial/industrial worker exposure to groundwater are presented in RAGS Part D Tables 4.1 and 4.2. An EF of 250 days/year and ED of 25 years were assumed (USEPA, 2002b). An event duration (t-event) [or exposure time (ET) depending on the equation] of 8 hours (USEPA, 1997b) was used, assuming that any potential washing activities occur continuously over the course of a typical 8-hour work day. The event frequency (EV) was 1 event per day (USEPA, 2002b).

The skin surface area (SA) available for dermal contact was assumed to be 3,300 cm^2, corresponding to the area of the face, forearms, and hands (USEPA, 2002b). An average body weight (BW) of 70 kg for an adult was used (USEPA, 2002b).

Other parameters needed to calculate DA_{event} include chemical-specific parameters, such as the fraction absorbed (FA), dermal permeability coefficient (Kp), and lag time per event (T-event). The Kp reflects movement across the skin to the underlying skin layers and into the bloodstream. The chemical-specific parameter for the ratio of Kp through the stratum corneum relative to its permeability coefficient across the viable epidermis (B) does not appear in the equation for DA_{event} for short exposure times, because DA_{event} is not a function of B at short exposure times. For short exposure times, the amount of chemical absorbed depends only on permeability of the stratum corneum. The chemical- and exposure scenario-specific factors used in the calculation of DA_{event} for the commercial/industrial worker are presented in Appendix E.

3.4.2.2. Construction/Utility Workers

The exposure parameters used to model construction/utility worker exposure to groundwater are presented in RAGS Part D Tables 4.3 and 4.4. Due to the short-term nature of construction/utility work around an excavation for utility installation, maintenance, or repair, the EF for the construction/utility worker was assumed to be 60 days, representing exposure equivalent to three work months. An ED of 1 year was used, assuming construction/utility work at a single location is unlikely and that work by the same individual is even less likely. A t-event or ET of 8 hours (USEPA, 1997b) and EV of 1 event per day (USEPA, 2002b) were also assumed.

A skin SA of 3,300 cm^2, corresponding to the area of the face, forearms, and hands, was assumed (USEPA, 2002b). An average BW of 70 kg for an adult was used (USEPA, 2002b). Chemical-specific factors used in the calculation of DA_{event} for the construction/utility worker appear in Appendix E.

3.4.2.3. Resident Adults and Children

The exposure parameters used to model residential exposure to groundwater are presented in RAGS Part D Tables 4.5 to 4.7. To evaluate the potable use scenario, groundwater ingestion rates (IR-W) of 2 liters/day and 1 liter/day were assumed for resident adults and children, respectively; they represent the 90^{th} percentile values for daily water consumption by adults and infants (USEPA, 2002b). The average adult BW of 70 kg was used for the resident adult, while the average BW of 15 kg for a child (ages 0 to 6) was used for the resident child (USEPA, 2002b).

An EF of 350 days/year was used for resident adults and children, assuming 15 days away from the home over the course of a year (USEPA, 1991). EDs of 30 years (the 90th percentile time at one residence) for resident adults and 6 years for resident children were used. However, in evaluating cancer risks for resident adults, the ED of 30 years was based on 6 years at the child's rate of exposure and 24 years at the adult's rate of exposure (USEPA, 1991).[11]

As the greatest, but not exclusive, opportunity for dermal exposure in the home is during showering or bathing, the entire surface area of the body was used to evaluate dermal exposure. Skin SAs of 18,000 cm^2 and 6,600 cm^2 were used for adults and children, respectively. These values represent the average of 50^{th} percentile total body surface areas for adult males and females and a time-weighted average surface area for a 0 to 6-year old child using 50^{th} percentile total body surface areas for male and female children, respectively (USEPA, 2004). ETs for dermal contact of 0.25 hours/event (i.e., 15 minutes/event) for adults during showering and 0.45 hours/day (i.e., 20 minutes/day) for children during bathing were used (USEPA, 2003a). Assuming inhalation exposures to volatile COPCs in bathroom air may occur after showering or bathing, ETs for inhalation exposure of 0.58 hours/event for adults (representing 0.25 hours showering and 0.33 hours in the bathroom after showering) and 1 hour/event for children (representing 0.45 hours bathing and 0.55 hours in the bathroom after bathing) were used (USEPA, 2004).

The USEPA (2004) recommends use of a screening procedure for evaluating dermal contact with organic COPCs in water where the receptor is also exposed via ingestion (i.e., resident adults and children). Typically following this screening procedure, an organic COPC is evaluated for the dermal contact exposure route only if exposure from dermal contact exceeds 10% of the intake from ingestion. In addition, for dermal contact with the volatile COPCs, the EPCs in groundwater were adjusted by a factor of 0.9 for the RME scenario and 0.5 for the CTE scenario (USEPA, Region 2, 2011). This adjustment accounts for the fact that as the volatile COPCs are released from the water to air, less of the VOC concentrations are available for dermal contact. Otherwise, dermal contact with groundwater was as described above. Chemical-specific factors used in the calculation of DA_{event} for the resident adults and children appear in Appendix E.

[11] It is recognized that for consistency, the ED for evaluating non-cancer hazards for the resident adult may be changed to 24 years. However, whether 24 or 30 years is used as the ED, the factor is canceled out by the averaging time (which is equivalent to ED*365 days) in the exposure equation, therefore yielding the same non-cancer hazard quotient.

Lastly, to evaluate cancer risks from exposure to COPCs with a mutagenic mode of action, age-adjusted exposure factors were calculated for each of the following age groups: 0-2 years, 2-6 years, 6-16 years, and 16-30 years. These calculations are presented in RAGS Part D Table 4.7, were used to calculate chemical-specific intakes and dermally absorbed doses in RAGS Part D Table 7.5 and 7.6, and facilitated application of age-dependent adjustment factors (ADAF) to toxicity values for carcinogenic COPCs with a mutagenic mode of action (further described in Section 4.2). For this reason, exposure parameters for the resident adult and resident child are presented in Table 4.7 for each year between 0 and 30 years of age.

4. Toxicity Assessment

The toxicity assessment, also termed the dose-response assessment, serves to characterize the relationship between the magnitude of exposure and the potential that an adverse health effect will occur. It involves determining whether exposure to a chemical can cause an increase in the incidence of a particular adverse health effect and characterizing the nature and strength of the evidence of causation. The toxicity information is then quantitatively evaluated and the relationship between the dose of the chemical received and the incidence of adverse health effects in the exposed population is evaluated.

The USEPA and other regulatory agencies have performed toxicity assessments for numerous chemicals, and the guidance they provide was used in this BHHRA. These include reference doses (RfD) and reference concentrations (RfC) for the evaluation of noncarcinogenic health effects from chronic and subchronic exposure to chemicals and cancer potency slope factors and unit risk factors for evaluating incremental cancer risk from exposure to chemicals prorated over a lifetime. Sources of toxicological information and toxicity values, in order of preference consistent with USEPA (2003c) guidance, include:

- Tier 1 - Integrated Risk Information System (IRIS) (USEPA, 2011b). IRIS is an internet database that has received internal and external scientific review and contains current information on human health effects that may result from exposure to chemicals in the environment. IRIS was accessed at: http://www.epa.gov/iris

- Tier 2 - Provisional Peer-Reviewed Toxicity Values (PPRTV). PPRTVs were developed by the USEPA Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center and are available as chemical-specific issue papers at the following website: http://hhpprtv.ornl.gov/.

- Tier 3 - Additional USEPA and non-USEPA sources of toxicity information, including but not limited to the California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment's chronic reference exposure levels and cancer potency values, the Agency for Toxic Substances and

Disease Registry (ATSDR) minimal risk levels, and toxicity values published in the USEPA Health Effects Summary Tables (HEAST) (USEPA, 1997a).

4.1. Noncarcinogenic Effects from Chronic Exposure to COPCs

The USEPA (1990) indicates that acceptable exposure levels for chemicals with non-cancer health effects should represent concentration levels to which the human population, including sensitive subpopulations (e.g., the elderly, young children, etc.), may be exposed without adverse health effects during a lifetime or part of a lifetime, incorporating an adequate margin of safety. The potential for non-cancer health effects associated with oral and dermal exposures is evaluated by comparing an estimated chemical intake or DAD over a specified time period with an RfD derived for a similar exposure period. The RfD is an estimate of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. Therefore, the ratio of the intake or DAD to the RfD, termed the hazard quotient (HQ), assumes there is a level of exposure (i.e., the RfD) below which it is unlikely for even sensitive subpopulations to experience adverse health effects.

The potential for non-cancer health effects associated with inhalation exposures is evaluated by comparing COPC concentrations in air (i.e., ECs) to RfCs derived for a similar exposure period (USEPA, 2009a). The HQ was estimated by calculating the ratio of the EC to the RfC.

The USEPA has indicated that RfDs and RfCs are based on the assumption that thresholds exist for certain toxic effects and that they often have an uncertainty spanning perhaps an order of magnitude. Chronic RfDs and RfCs were specifically developed to be protective of long-term exposure to a chemical. For construction/utility workers, whose exposure is assumed to occur over a one-year period, subchronic RfDs and RfCs were used, where available. For some chemicals, subchronic RfDs and RfCs were estimated from chronic RfDs and RfCs available in IRIS by removing the uncertainty factor applied where a chronic RfD or RfC was extrapolated from a subchronic study. Chronic RfDs and RfCs were used as conservative approximations where subchronic values were not available or could not be estimated.

The RfDs and RfCs for the characterization of potential chronic and subchronic non-cancer health effects via oral and inhalation exposures are presented in RAGS Part D Table 5.1 and Table 5.2 (see Appendix A), respectively, along with the primary target organ, the combined uncertainty and modifying factors used in the derivation of the RfD and RfC, and the source of the RfD and RfC. Generally, order-of-magnitude (i.e., in increments of 10) uncertainty factors reflect the various types of toxicological data (e.g., a laboratory animal study extrapolated to the human condition) used to estimate the RfDs and RfCs. Modifying factors, which can range from greater than zero to 10, reflect qualitative professional judgment regarding scientific uncertainties (e.g., the completeness of the overall database) not covered by the uncertainty factor. Application of the uncertainty and modifying factors is intended to result in RfDs and RfCs that are protective of human health.

RfDs are not available to evaluate dermal exposure. In their absence, oral RfDs were used and adjusted following USEPA (2004) guidance to reflect absorbed dose. This allows for comparison between exposures estimated as absorbed doses and toxicity values expressed as absorbed doses. The oral-to-dermal adjustment factors and the adjusted RfDs are presented in RAGS Part D Table 5.1.

4.2. Carcinogenic Effects from Lifetime Exposure to COPCs

Regardless of the mechanism of effect, risk evaluation methods employed by the USEPA generally derive from the hypothesis that thresholds for cancer induction by carcinogens do not exist and that the dose-response relationship is linear at low doses. Based on this hypothesis, the USEPA has derived estimates of incremental cancer risk from lifetime exposure to potential carcinogens. This is accomplished by establishing the carcinogenic potency of the chemical through critical evaluation of the various test data and fitting dose-response data to a low-dose extrapolation model. The slope factor, which describes the dose-response relationship at low doses, is expressed as a function of intake [i.e., $(mg/kg\text{-}day)^{-1}$].

Incremental lifetime cancer risks from oral and dermal exposures are estimated by multiplying an estimated daily intake or DAD prorated over 70 years by the slope factor. The resulting risk estimate is expressed as a unitless probability (e.g., 2×10^{-5} or 2 in 100,000) of an individual developing cancer. The unitless probability represents the incremental (or increased) lifetime cancer risk associated with the estimated exposure above the background risk of developing cancer. This linear equation is valid only at low risk levels (i.e., below estimated risks of 0.01). According to the USEPA, this approach does not necessarily give a realistic prediction of risk. The true value of the risk at trace ambient concentrations is unknown, and may be as low as zero.

To evaluate inhalation exposures, inhalation unit risk factors that relate cancer potency to a chemical concentration in air were used instead of slope factors (USEPA, 2009a). Incremental lifetime cancer risks from inhalation exposure were estimated by multiplying the EC by the unit risk factor.

The oral and inhalation slope factors and unit risk factors for the carcinogenic COPCs are presented in RAGS Part D Table 6.1 and Table 6.2 (see Appendix A), respectively. These toxicity values were used to estimate finite, upper limits of risk at low dose levels administered over a lifetime. For children, the estimated cancer risk reflects the potential risk over a lifetime due to childhood exposure. The USEPA weight-of-evidence classification under the USEPA's 1986 guidelines for carcinogen risk assessment (USEPA, 1986) or cancer guideline description under USEPA's revised carcinogen risk assessment guidelines (USEPA, 2005b, 1999, 1996a) for carcinogenicity and the source of slope factors or unit risk factors are also presented in RAGS Part D Tables 6.1 and 6.2.

Seven of the polycyclic aromatic hydrocarbons (PAH) [i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] are considered probable human carcinogens of varying potency. With the exception of chrysene, all of these PAHs were identified as COPCs in one or more groundwater data sets. Potency factors relative to the carcinogenicity of benzo(a)pyrene, the most studied and most potent of the carcinogenic PAHs, have been developed (USEPA, 1993) and were used to derive the cancer slope factors for the other carcinogenic PAHs.

The USEPA indicates that early-life exposure to carcinogenic chemicals with a mutagenic mode of action can result in a greater contribution to cancers appearing later in life (USEPA, 2005a). To account for this, ADAFs were applied to the oral slope factors and unit risk factors for carcinogenic COPCs with a mutagenic mode of action. The USEPA (2005a) recommends a ten-fold adjustment for exposure during 0 and 2 years of age, a three-fold adjustment for exposures between 2 and 16 years of age, and no adjustment for exposures after turning 16 years of age.

The COPCs in this BHHRA for which ADAFs were applied are chromium VI, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene (USEPA, 2011c). To facilitate the application of ADAFs, intakes and dermally absorbed doses were calculated for each of the following age groups: 0-2 and 2-6 for the resident child; 0-2, 2-6, 6-16, and 16-30 for the resident adult. For the current/future resident child, an ADAF of 10 was applied to the cancer toxicity values to evaluate exposure from the ages 0 to 2, and an ADAF of 3 was applied to evaluate exposure from the ages of 2 to 6. For the current/future resident adult, an additional ADAF of 3 was applied to evaluate exposure from the ages of 6 to 16. No adjustment was made to evaluate exposure from the ages of 16 to 30.

As with RfDs, the USEPA has not derived slope factors to evaluate dermal exposure. In their absence, slope factors for oral exposure were used and adjusted per USEPA guidance to reflect absorbed dose. This allows for risk estimation based on exposures estimated as absorbed doses and slope factors expressed as absorbed doses. The oral-to-dermal adjustment factors and the adjusted slope factors are presented in RAGS Part D Table 6.1.

4.3. Noncarcinogenic Effects from Chronic Exposure to Lead

The USEPA has not developed standard estimates representing a dose-response assessment for lead, because a clear threshold for some of the more sensitive effects in humans from exposure to lead has not been identified (ATSDR, 2007). Rather, exposure to lead is typically evaluated in terms of the increase in blood lead (PbB) concentrations following exposure. The United States Department of Health and Human Services' Centers for Disease Control and Prevention and the ATSDR have designated, and the USEPA has adopted, 10 micrograms per deciliter (μg/dL) as a PbB concentration of concern to protect sensitive populations (e.g., neonates, infants, and children). The USEPA's stated goal for lead is that children have no more than a 5 percent probability of exceeding a PbB concentration of 10 μg/dL (USEPA, 2009d).[12] As such, this level is assumed to also provide protection for adults.

For resident children exposed to lead, the evaluation is facilitated through the use of the USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children (USEPA, 2002a, 1994), accessed at:
www.epa.gov/superfund/programs/lead/products.htm. The IEUBK model uses detailed multi-compartment biokinetic modeling. Relationships are defined within the IEUBK model between external sources of lead exposure from various media (e.g., soil, dust, air, water, diet) and internal compartments, such as plasma or extra-cellular fluid, red blood cells, other soft tissue, trabecular (spongy) bone, and cortical (compact) bone. In the uptake portion of the model, lead uptake through the lung and gastrointestinal tract are

[12] Recent evidence suggests that adverse health effects may occur at PbB concentrations of 5 μg/dL or lower (USEPA, 2009b). However, the USEPA Office of Superfund Remediation and Technology Innovation has not yet developed new lead policy to address this recent evidence.

estimated based on absorption coefficients (i.e., percent of lead absorbed). The biokinetic portion of the model estimates transfer between internal body compartments using transfer coefficients. This biokinetic transfer is conducted for multiple time steps. Default lung and gastrointestinal tract absorption factors were used. The biokinetic transfer coefficients and number of time steps are model-defined.

A model for quantitatively evaluating the potential for adverse health effects from adult exposure to lead in groundwater is currently not available. Rather, a qualitative discussion of the potential for adverse health effects in adult workers was included in the Risk Characterization.

4.4. Chemical Mixtures

USEPA guidance was also used to evaluate the overall potential for non-cancer health effects and cancer risks from exposure to multiple chemicals. For the evaluation of non-cancer health effects, USEPA guidance assumes that sub-threshold exposures to several chemicals at the same time could result in an adverse health effect. The sum of the HQs (for individual chemicals, exposure routes, exposure pathways, or potentially-exposed populations) is termed the hazard index (HI). Generally, hazard indices are only used in the evaluation of a mixture of chemicals that induce the same effect by the same mechanism of action. In this BHHRA, the hazard indices of a mixture of chemicals that can have different effects were used as a screening-level approach, as recommended by the USEPA (1989). This approach may overestimate the likelihood of adverse, non-cancer health effects. Therefore, for hazard indices that were greater than 1, toxic endpoint-specific hazard indices were calculated based on the toxicological endpoint (e.g., liver effects) used to derive the RfD.

For the evaluation of cancer risks, USEPA guidance indicates that the individual risks associated with exposure to each chemical can be summed. This approach was used in this BHHRA and assumes independence of action by the chemicals involved (i.e., that there are no synergistic or antagonistic chemical interactions and that all chemicals produce the same effect: cancer).

4.5. COPCs without Toxicity Values

Toxicity values (i.e., RfDs, RfCs, cancer slope factors, and unit risk factors) were not available to quantitatively assess the potential for human health risks for the following COPCs: benzo(g,h,i)perylene, phenanthrene, delta-BHC, endosulfan sulfate, endrin aldehyde. Possible health implications that may be associated with exposure to these chemicals are described in the Risk Characterization.

5. Risk Characterization

Risk characterization involves combining exposure estimates with toxicity information to generate incremental lifetime cancer risks and non-cancer hazards for each human exposure scenario evaluated in the BHHRA. In this section, the cancer risks and non-cancer hazards are presented and discussed. The potential for adverse, non-cancer health effects from exposure to lead in potable groundwater is also discussed with respect to the results of the IEUBK model. Lastly, sources of uncertainty in this BHHRA are documented and discussed.

5.1. Cancer Risks and Non-cancer Hazards

As described in Section 4.2, individual cancer risks are expressed as unitless probabilities (e.g., 2E-05 or 2 in 100,000) of a person developing cancer. The total individual (i.e., COPC-specific) cancer risks are summed for each exposure pathway and scenario to arrive at an estimate of the potential for cancer risk from cumulative exposure. For known or suspected carcinogens, the NCP established that acceptable exposure levels are generally concentration levels that represent an incremental upper-bound lifetime cancer risk in the range from 10^{-4} (i.e., 1E-04 or 1 in 10,000) to 10^{-6} (i.e., 1E-06 or 1 in 1,000,000) or less (USEPA, 1990). The cancer risks estimated for each exposure scenario were therefore compared to this risk range established by the NCP.

As described in Section 4.1, the potential for non-cancer health effects associated with chemical exposure was evaluated by calculating the ratio of an estimated intake or EC over a specified time period with a chemical-specific RfD or RfC derived for a similar exposure period. The RfD or RfC is an estimate of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. The non-cancer HQ therefore assumes there is a level of exposure below which it is unlikely for even sensitive subpopulations to experience adverse health effects. The total individual HQs were summed for each exposure pathway and scenario to yield HIs representative of the potential for adverse, non-cancer health effects from cumulative exposure. For the non-cancer assessment, exposure scenarios with an HI greater than 1E+00 are of potential concern.

The COPC and exposure route-specific incremental lifetime cancer risks and non-cancer HQs associated with potential exposure to the receptors evaluated in this BHHRA are presented in RAGS Part D Tables 7.1.RME to 7.6.RME. The total incremental lifetime cancer risks and total non-cancer HI for the COPCs summed for all exposure routes are presented in RAGS Part D Tables 9.1.RME to 9.6.RME. Where the total cancer risk or total HI is greater than, respectively, the risk range established by the NCP or a target HI of 1E+00, the COPCs that are the predominant contributors to the risk or hazard estimates are presented in the corresponding RAGS Part D Table 10. Where a total non-cancer HI is greater than 1E+00, toxic endpoint-specific HIs were calculated and presented in the corresponding RAGS Part D Table 9. If a COPC had more than one toxic endpoint (e.g., liver effects and kidney effects), the total HI was accounted for in each toxic endpoint category that applies to the COPC.

The cancer risks and non-cancer HIs are summarized in Table 7-1 for the RME scenario and Table 7-2 for the CTE scenario. The cancer risks and non-cancer HIs are presented and discussed by receptor population in the following sections.

5.1.1. Current/Future Commercial/Industrial Worker

RAGS Part D Table 7.1.RME presents the calculation of incremental lifetime cancer risks and non-cancer hazards for each of the exposure pathways and routes evaluated for the commercial/industrial worker. As shown, the total cancer risk is 4E-03, which is greater than the risk range established by the NCP. The HI is 9E+01, which is greater than the target HI of 1E+00.

Based on the RME assumptions used in this BHHRA, cancer risks greater than the risk range established by the NCP were estimated for both the dermal contact (1E-03) and inhalation exposure routes (3E-03). As shown in RAGS Part D Table 10.1.RME, the predominant contributor to these cancer risks is TCE, which accounts for 77% of the total cancer risk. Use of CTE parameters yielded a total cancer risk of 4E-04 (RAGS Part D Table 10.1.CT).

The potential for non-cancer hazard was also indicated for both exposure routes evaluated: dermal contact (8E+01) and inhalation (2E+01). The highest non-cancer HI presented in RAGS Part D Table 10.1.RME was estimated for total PCB Aroclors, which accounts for 62% of the total non-cancer hazard. Use of CTE parameters yielded a non-cancer HI of 7E+01 (RAGS Part D Table 10.1.CT).

5.1.2. Current/Future Construction/Utility Worker

RAGS Part D Table 7.2.RME to Table 7.4.RME present the calculation of incremental lifetime cancer risks and non-cancer hazards for each of the exposure units, exposure pathways and routes evaluated for the construction/utility worker.

For the shallow onsite groundwater exposure unit (RAGS Part D Table 7.2.RME), the total cancer risk is 5E-05, which is within the risk range established by the NCP. The non-cancer HI is 7E+01, which is greater than the target HI of 1E+00. As shown in RAGS Part D Table 10.2.RME, the non-cancer hazard is predominantly due to total PCB Aroclors (77%) and cis-1,2-dichloroethene (23%). Use of CTE parameters yielded a total cancer risk of 1E-05 (RAGS Part D Table 7.2.CT), which is within the risk range established by the NCP. The non-cancer HI under the CTE scenario is 6E+01, which is still greater than the target HI of 1E+00.

For the shallow offsite groundwater, south of Bound Brook exposure unit (RAGS Part D Table 7.3.RME), the total cancer risk is 3E-05, which is within the risk range established by the NCP. The non-cancer HI is 2E+01, which is greater than the target HI of 1E+00. As shown in RAGS Part D Table 10.3.RME, the non-cancer hazard is from exposure to total PCB Aroclors. Use of CTE parameters yielded a total cancer risk of 8E-06 and a non-cancer HI of 2E+01, as shown in RAGS Part D Table 7.3.CT.

For the shallow offsite groundwater, north of Bound Brook exposure unit (RAGS Part D Table 7.4.RME), the total cancer risk is 8E-07, which is less than the risk range established by the NCP. The non-cancer HI is 3E+00, which is greater than the target HI of 1E+00. As shown in RAGS Part D Table 10.4.RME, the non-cancer hazard is from exposure to total PCB Aroclors. Use of CTE parameters yielded a total cancer risk of 2E-07 and a non-cancer HI of 3E+00, as shown in RAGS Part D Table 7.4.CT.

5.1.3. Current/Future Resident Adult

RAGS Part D Table 7.5.RME presents the calculation of incremental lifetime cancer risks and non-cancer hazards for each of the exposure pathways and routes evaluated for the resident adult. As shown, the total cancer risk is 7E-03, which is greater than the risk range established by the NCP. The HI is 3E+02, which is greater than the target HI of 1E+00.

Based on the RME assumptions used in this BHHRA, cancer risks greater than the risk range established by the NCP were estimated for all of the exposure routes evaluated: ingestion (4E-03), dermal contact (2E-03), and inhalation (1E-03). As shown in RAGS

Part D Table 10.5.RME, the predominant contributors to these cancer risks are TCE (25%) and arsenic (24%). Use of CTE parameters yielded a total cancer risk of 2E-04 (RAGS Part D Table 10.5.CT).

The potential for non-cancer hazard was also indicated for all of the exposure routes evaluated under the RME scenario: ingestion (2E+02), dermal contact (9E+01), and inhalation (4E+00). The highest non-cancer HIs presented in RAGS Part D Table 10.5.RME were estimated for cis-1,2-dichloroethene (65%) and total PCB Aroclors (28%). Use of CTE parameters yielded a non-cancer HI of 2E+02 (RAGS Part D Table 10.5.CT).

5.1.4. Current/Future Resident Child

RAGS Part D Table 7.6.RME presents the calculation of incremental lifetime cancer risks and non-cancer hazards for each of the exposure pathways and routes evaluated for the resident child. As shown, the total cancer risk is 3E-03, which is greater than the risk range established by the NCP. The HI is 7E+02, which is greater than the target HI of 1E+00.

Cancer risks greater than the risk range established by the NCP were estimated for all of the exposure routes evaluated: ingestion (2E-03), dermal contact (9E-04), and inhalation (5E-04). As shown in RAGS Part D Table 10.6.RME, the predominant contributors to these cancer risks are TCE (27%) and arsenic (24%). Use of CTE parameters yielded a total cancer risk of 1E-03 (RAGS Part D Table 10.6.CT).

The potential for non-cancer hazard was also indicated for all of the exposure routes evaluated: ingestion (5E+02), dermal contact (2E+02), and inhalation (1E+01). The highest non-cancer HIs presented in RAGS Part D Table 10.6.RME were estimated for cis-1,2-dichloroethene (65%) and total PCB Aroclors (28%). Use of CTE parameters yielded a non-cancer HI of 4E+02 (RAGS Part D Table 10.6.CT).

5.2. Discussion of Cancer Risks and Non-cancer Hazards

Table 7-1 and Table 7-2 present a summary of the cancer risks and non-cancer hazards estimated for each receptor under the RME and CTE scenarios, respectively. The greatest cancer risks, greater than the risk range established by the NCP, were estimated for the commercial/industrial worker, resident adult, and resident child exposed to chemicals in the entire aquifer. The cancer risks estimated for the construction/utility worker were less than or within the risk range established by the NCP for all three shallow groundwater exposure units. However, the potential for adverse, non-cancer health effects was indicated for all of the potential receptor populations and exposure units evaluated in this BHHRA, under both the RME and CTE scenarios.

The potential for cancer risk indicated for commercial/industrial workers is largely attributable to concentrations of TCE in the entire aquifer, while cancer risks for the resident adult and resident child are primarily attributable to concentrations of TCE and arsenic in the entire aquifer. However, concentrations of other chemicals in the entire aquifer [i.e., tetrachloroethene, vinyl chloride, total PCB Arocolors, dibenzo(a,h)anthracene, heptachlor, and 2,3,7,8-TCDD TEQ] also resulted in cancer risks greater than the risk range established by the NCP. For all receptors evaluated, the potential for adverse, non-cancer health effects was indicated for total PCB Aroclors. For the resident adult and resident child, the predominant contributor to the non-cancer hazard is cis-1,2-dichloroethene. However, concentrations of 1,2,4-trichlorobenzene, 2,3,7,8-TCDD TEQ, and arsenic also resulted in non-cancer HIs greater than 1E+00.

Further evaluation of the entire aquifer data set reveals relatively elevated COPC concentrations in a few wells located within the former CDE facility boundary. This observation was also noted in Section 2.3, which described the groundwater exposure units established for this BHHRA, and Section 3.3.1, which discussed the derivation of EPCs for the COPCs in each data set. As noted in the rationale for excluding pesticide and PCB concentrations greater than aqueous solubility from the baseline evaluation, the presence of relatively elevated COPC concentrations in just a few wells biases the calculated EPCs high, such that the cancer risks and non-cancer hazards estimated using the entire aquifer data set do not reflect the potential for adverse health effects from exposure to groundwater across the Site. Therefore, this section presents an alternate evaluation that excludes data from the onsite monitoring wells in which relatively elevated chemical concentrations were observed. The intention is to show whether any risk reduction might be achieved by preventing human exposure to concentrations detected in these few onsite monitoring wells.

The alternate evaluation focuses on just those COPCs listed in Table 10.1RME, Table 10.5RME, and Table 10.6RME, as they are the greatest contributors to the cancer risks and non-cancer hazards estimated using the entire aquifer data set. As shown in RAGS Part D Table 2.1, the maximum detected concentrations of all of these COPCs (except for arsenic) were observed in MW-06, MW-11, MW-12, and MW-14S-04.[13] Appendix F, Table F-1 presents the MW-06, MW-11, MW-12, and MW-14S (sampler ports 1 through

[13] The maximum detected concentration of arsenic was detected in FPW-01.

4) sample results for each COPC. These concentrations (or reporting limits for non-detect results) were excluded from the entire aquifer data set, and alternate EPCs for each COPC were derived using ProUCL. Where applicable, Table F-1 also shows the pesticide, total PCB Aroclor, and 2,3,7,8-TCDD TEQ concentrations that were already excluded from the baseline evaluation based on comparison to chemical-specific aqueous solubility limits. As presented in Section 3.3.1, these concentrations were also detected in MW-11, MW-12, and MW-14S.

Table F-2 presents the alternate EPCs compared to those used in the baseline evaluation. As shown, EPCs for many of the COPCs were reduced by at least one order of magnitude. The EPC for 2,3,7,8-TCDD TEQ was not revised, as there were no additional sample results to exclude. The EPCs for dibenzo(a,h)anthracene and arsenic are effectively the same.

Table F-3 presents the alternate cancer risks and non-cancer hazards estimated by replacing the EPCs for just these select COPCs in the RAGS Part D Table 7RMEs for the commercial/industrial worker, resident adult, and resident child. As shown, some risk reduction is afforded by removing groundwater data from the select onsite wells with relatively elevated concentrations. Tetrachloroethylene and heptachlor are no longer predominant contributors to the estimated risks or hazards. Therefore, the unacceptable cancer risks and non-cancer hazards predicted for these COPCs can be explained by relatively elevated concentrations in a few onsite monitoring wells, and these conditions are not widespread throughout OU3. However, the total cancer risks and non-cancer hazards are still greater than, respectively, the risk range established by the NCP and the target non-cancer HI of 1E+00. In addition, even after excluding these concentrations from the entire aquifer data set, a variety of COPCs have one or more elevated concentrations compared to federal or NJDEP MCLs: 13 VOCs, three SVOCs, five pesticides, PCB Aroclors, and eight metals.

The alternate evaluation demonstrates that while a portion of the baseline cancer risks and non-cancer hazards can be explained by relatively elevated concentrations in a few onsite monitoring wells, chemical concentrations throughout the entire aquifer would still result in unacceptable cancer risks and non-cancer hazards according to the exposure scenarios presented in this BHHRA. The alternate evaluation also reveals that selective removal of the pesticide and PCB concentrations greater than aqueous solubility is not likely to affect the RI conclusions overall, because pesticide contamination is not widespread throughout OU3 and unacceptable risks/hazards from total PCB Aroclors and 2,3,7,8-TCDD TEQ are indicated even without the influence of the most elevated concentrations. In addition, selective removal of the most elevated pesticide concentrations is reasonable, considering these chemicals are not primary Site-related contaminants and such elevated concentrations are not likely migrating outside the boundary of the former CDE facility. Lastly, it is possible the laboratory analysis of pesticides was influenced by elevated PCB concentrations in the groundwater samples and that some observed concentrations are false positive results.

The primary Site-related contaminants are chlorinated VOCs and PCBs. This BHHRA confirms there is a potential for unacceptable cancer risk and non-cancer hazard from exposure to concentrations of TCE and its degradation products (e.g., cis-1,2-dichloroethene and vinyl chloride), total PCB Aroclors, and 2,3,7,8-TCDD TEQ in groundwater.

The potential for risk indicated for residential exposure to arsenic in the entire aquifer is likely attributable to background conditions in central New Jersey. As presented in the New Jersey Geological Survey (NJGS) publication referenced in Section 5.7 of the RI Report, the range of arsenic concentrations detected in 94 domestic wells sampled within a 200-square mile area in the central part of the Newark Basin was <1 to 57 µg/L, and only 15% of the concentrations were greater than 10 µg/L (NJGS, 2004). Generally, arsenic concentrations in the majority of the wells/ports sampled at OU3 may be considered representative of regional background conditions, as defined by the NJGS (2004) publication. There are isolated concentrations of arsenic that are relatively elevated and may be considered outliers or potential "hotspots." These outliers mostly occur in off-site wells (all are off-site except FPW, MW-14D, and MW-16) and at various depths (shallow, intermediate, and deep), both north and south of Bound Brook. There is no discernible pattern which would indicate a potential source area contributing to the arsenic observed in all of these wells, and the presence of these outliers may still be consistent with regional background, as localized areas with arsenic concentrations as high as 90 µg/L, 120 µg/L, and 215 µg/L were also reported in NJGS (2004). Therefore, the potential for risk indicated for arsenic in this BHHRA is considered an artifact of background conditions.

5.3. Lead

The potential for adverse health effects from exposure to lead is evaluated through comparison of predicted PbB concentrations to a health-protective target PbB concentration. As stated in Section 4.3, the USEPA's stated goal for lead is that children have no more than a 5 percent probability of exceeding a PbB concentration of 10 µg/dL

(USEPA, 2009d). As such, this concentration is assumed to also provide protection for adults.

The USEPA's IEUBK model was used to evaluate the potential for exposure of resident children to lead in groundwater used as a source of potable water. The focus of the IEUBK model is the prediction of PbB concentrations in young children exposed to lead from several sources and by ingestion and inhalation exposure routes. The model uses four interrelated modules (exposure, uptake, biokinetic, and probability distribution) to mathematically and statistically link environmental lead exposure to PbB concentrations for a population of young children (birth to 84 months of age). A plausible distribution of PbB concentrations, centered on a geometric mean PbB concentration, is predicted and used to estimate the probability that a child's or a population of children's PbB concentrations will exceed the target PbB concentration. The IEUBK model is intended for a residential exposure scenario, as it considers inhalation and ingestion exposures to indoor air and dust that result from tracking soil into the home, as well as dietary and drinking water exposures.

Children ages birth to 7 years old were modeled. Consistent with USEPA guidance, the arithmetic mean lead concentration in the entire aquifer data set was used as the EPC for lead in groundwater. IEUBK model defaults for lead in outdoor and indoor air, lead in the diet, lead in soil, and maternal lead concentration were used. The multiple source analysis option was selected to model an average household indoor dust concentration. Information on all parameters is presented in the RAGS D IEUBK Lead Worksheet provided in Appendix E.

Predicted lead uptakes and PbB concentration for each age interval are shown in the model output, also in Appendix E. A plausible distribution of PbB concentrations, centered on a geometric mean PbB concentration, was predicted and used to estimate the probability that a child's or a population of children's PbB concentrations will exceed the target PbB concentration. This probability density distribution is shown with the model output. Based on the IEUBK model, the estimated geometric mean PbB concentration is 2.6 μg/dL, and the probability that the PbB concentration is greater than 10 μg/dL is 0.22 percent. Therefore, lead concentrations in groundwater should not pose a risk to resident children. By extension, lead concentrations in groundwater also should not pose a risk to resident adults.

5.4. Qualitative Assessment of Groundwater Vapor Migration to Outdoor Ambient Air Pathway

As established in RAGS Part D Table 1, uncertainties associated with quantitatively modeling ambient air concentrations following volatilization from groundwater that may include DNAPL in fractured bedrock precludes the calculation of cancer risks and non-cancer hazards from exposure to estimated concentrations of volatile chemicals in outdoor air. Rather, a qualitative evaluation of the pathway by which volatile chemicals migrate through the bedrock and overburden to outdoor ambient air is presented herein. The focus of the evaluation is on the potential for migrating vapors to attenuate or decrease to concentrations in outdoor air that do not pose a human health risk.

Table 7-3 presents the volatile chemicals and their maximum concentrations detected in each of the shallow groundwater exposure units established for this BHHRA. The source vapor concentration corresponding to each maximum chemical concentration was calculated using the following equation, assuming the vapor and aqueous-phase concentrations are in local equilibrium according to Henry's law (USEPA, 2003b):

$$C_{v,s} = C_{gw} \times H' \times CF$$

Where:

$C_{v,s}$ = source vapor concentration ($\mu g/m^3$)
C_{gw} = maximum groundwater concentration ($\mu g/L$)
H' = Henry's Law constant (unitless)
CF = conversion factor, 1E+03 L/m^3

Source vapor concentrations were then compared to the USEPA RSLs for Resident Air (USEPA, 2011a), which are based on either a target cancer risk of 1E-06 or a non-cancer HQ of 1, and a hypothetical attenuation factor was calculated as the ratio between the RSL and source vapor concentration. The hypothetical attenuation factor (e.g., 6E-05 for benzene in shallow onsite groundwater) represents the attenuation or dilution that would have to occur for the source vapor concentration to decrease to a concentration in outdoor air that does not pose a human health risk. In this scenario, such attenuation/dilution could occur during vapor diffusion through the subsurface or by mixing with outdoor ambient air.

As shown, the hypothetical attenuation factors for volatile chemicals detected in shallow onsite groundwater range from 2E-01 for m,p-xylene to 2E-08 for TCE. This implies a 200 million-fold dilution would have to occur for source vapor concentrations corresponding to the maximum detected TCE concentration in shallow onsite groundwater to decrease to the USEPA RSL for Resident Air. For some chemicals (e.g., acetone), no dilution would be needed, as the source vapor concentrations are less than the corresponding RSLs. The hypothetical attenuation factors for volatile chemicals in shallow offsite groundwater, south of Bound Brook range from 2E-02 for naphthalene to 2E-06 for TCE. For shallow offsite groundwater, north of Bound Brook, the hypothetical attenuation factors range from 7E-01 for toluene to 9E-06 for TCE.

The actual amount of attenuation that occurs as vapors migrate through the subsurface depends on the vertical distance from the groundwater source to the point of exposure, the nature and geometry of the subsurface materials, the presence/absence of preferential pathways, and the mobility and persistence of the chemical. The shallow groundwater data presented in this BHHRA represent samples from screened intervals as shallow as 17 feet bgs and as deep as 75 feet bgs (see Table 2-4). The maximum TCE concentrations in shallow groundwater were detected in samples from screened intervals less than 50 feet bgs. The USEPA (2003b) established 100 feet as a conservative measure of the vertical distance through which vapors might be expected to attenuate to "negligible" concentrations. However, due to the highly fractured and weathered nature of the shallow bedrock units, it is impossible to know what vertical distance would apply. It is instead expected that, should vapors migrate from the shallow groundwater through the bedrock and overburden to outdoor ambient air, mixing with ambient air would bring about the greatest decrease in vapor concentrations. In addition, for the portions of the Site that are developed with pavement or buildings, the groundwater to outdoor air exposure pathway is essentially incomplete.

5.5. Qualitative Assessment of COPCs without Toxicity Values

For some chemicals, toxicity studies are insufficient to determine RfDs/RfCs or slope factors/unit risk factors for oral and/or inhalation exposure. As a result, the cancer risks and non-cancer HIs may be underestimated. Toxicity values were not available for the following COPCs: benzo(g,h,i)perylene, phenanthrene, delta-BHC, endosulfan sulfate, and endrin aldehyde. While cancer risks and non-cancer hazards were not quantified, possible health implications that may be associated with exposure to these chemicals can be found in ATSDR Toxicological Profiles (as available) obtained through the following website: http://www. atsdr.cdc.gov/toxpro2.html.

- Benzo(g,h,i)perylene and phenanthrene.[14] These two chemicals are among the 17 PAHs typically analyzed for and evaluated at hazardous waste sites. The 17 PAHs often occur together in the environment and many have similar environmental fate and toxicological characteristics (ATSDR, 1995). However, reliable environmental fate and toxicological information exists for only a few of the 17 PAHs and the potential health effects of the other less well-studied PAHs must be inferred from this information (ATSDR, 1995). The USEPA (2011b) weight-of-evidence characterization for both chemicals is "D - not classifiable as to carcinogenicity" based on no human data and inadequate animal data.

- delta-BHC.[15] delta-BHC is one of eight isomers of the insecticide hexachlorocyclohexane (also called benzene hexachloride). While the toxicity of the isomers varies, all of them can produce liver and kidney effects (ATSDR, 2005). The USEPA (2011b) regards it as a possible human carcinogen based on increases in benign liver tumors in mice fed beta-HCH.

- Endosulfan sulfate.[16] Endosulfan sulfate is a reaction product found in technical endosulfan, a man-made insecticide, as a result of oxidation in nature, biotransformation, or photolysis. The only studies of longer term exposure to low concentrations of endosulfan are in animals. These animal studies indicate the kidneys, testes, and possibly the liver were affected (ATSDR, 2000). Endosulfan has not been classified by the USEPA with regard to its ability to cause cancer. The limited animal studies have not shown evidence of carcinogenicity. However, some of the animal studies have shown endosulfan can cause damage to genetic material within cells (ATSDR, 2000).

- Endrin aldehyde.[17] Endrin aldehyde is an impurity and breakdown product of endrin, which was used as a pesticide. There are no known adverse health effects based on long-term exposure to workers who have been exposed to endrin. Animal studies indicate the nervous system is likely the main toxic endpoint (ATSDR, 1996). The USEPA (2011b) classifies endrin as "D - not classifiable as to human carcinogenicity" based on animal studies in rats and mice.

[14] An ATSDR Toxicological Profile for PAHs is available from August 1995.
[15] An ATSDR Toxicological Profile for hexachlorocyclohexane is available from August 2005.
[16] An ATSDR Toxicological Profile for endosulfan is available from September 2000.
[17] An ATSDR Toxicological Profile for endrin is available from August 1996.

5.6. Uncertainty Evaluation

Risk assessment involves the integration of complex analyses of chemical concentrations in the environment, the fate and transport of chemicals in the environment, the potential for human exposure, and the chemical potency and/or toxicity. Some uncertainties are associated with each component in this process. Uncertainty in an HHRA is typically accounted for by identifying the sources of uncertainty and characterizing whether the risk estimates may be over-predicted or under-predicted. Within this section, the sources of uncertainty in this BHHRA are briefly discussed.

5.6.1. Data Evaluation

Sampling and analysis and data selection contribute to uncertainty in the baseline cancer risks and non-cancer hazards. Uncertainty associated with environmental sampling is generally related to limitations of the sampling in terms of the number and distribution of samples, while uncertainty associated with the analysis of samples is generally associated with systematic or random errors (i.e., false positive or negative results).

The cancer risks and non-cancer hazards estimated in this BHHRA are based on an extensive groundwater data set, which characterizes the entire aquifer, both horizontally and vertically, and accounts for seasonal variation. Sampling procedures detailed in the approved *Final Remedial Investigation/Feasibility Study Work Plan* (Malcolm Pirnie, 2008b) were followed to reduce the uncertainty associated with groundwater sample collection. Independent validation of the laboratory data was performed by USEPA Region 2 to reduce uncertainty associated with the sample analyses. As stated in Section 2.1, the majority of the groundwater data is of acceptable quality overall but subject to the data validator's qualifying remarks. As demonstrated in Table 2-3, sample reporting limits for some non-detect chemicals were greater than the USEPA RSLs used to select COPCs. Thus, the potential for exposure and adverse health effects may be overestimated or underestimated depending on how well groundwater was characterized.

Further evaluation of the metals data revealed detected arsenic concentrations in the first round of groundwater samples (October 2009) were consistently greater than those in the second round (March 2010). Similar statements can be made of copper, lead, and zinc. In some cases, the analytical results for a given well/port were at least ten times greater. Such differences may be attributed to seasonal variability or laboratory error; regardless, there is considerable uncertainty regarding the representativeness of samples from particular wells/ports with such different results.As stated in Section 2, the individual wells/ports selected for PCB congener and dioxin/furan analyses was based on the detected concentrations of PCB Aroclors in groundwater samples from October 2009. Because this sampling approach is biased toward wells that are most likely to contain contaminants due to historical activities at the former CDE facility, the potential for adverse health effects from exposure to 2,3,7,8-TCDD TEQ in groundwater across the Site was likely overestimated.

The most elevated pesticide and PCB concentrations were observed in a few onsite monitoring wells and were greater than chemical-specific aqueous solubility limits. These chemicals may therefore be present in those particular samples as NAPL or may be solubilized by the presence of other chemicals. As these conditions are not representative of groundwater across the Site, the individual concentrations greater than aqueous solubility were removed from the data sets used to calculate EPCs and estimate baseline cancer risks and non-cancer hazards. While the potential for adverse health effects from exposure to pesticide and PCB concentrations detected in the onsite monitoring wells may be underestimated, this BHHRA provides more realistic estimates of cancer risks and non-cancer hazards from exposure to groundwater across OU3. The potential for adverse health effects from exposure to chromium was likely overestimated, because total chromium concentrations in groundwater were evaluated using toxicity values specific to hexavalent chromium, which is the most toxic form of chromium.

Lastly, background conditions were not fully characterized in this BHHRA, as one well (ERT-8) is not an adequate basis for establishing background chemical concentrations. Groundwater data from ERT-8 were sufficient to benchmark the range of concentrations detected in the other monitoring wells, and they were presented as such in the RAGS Part D Table 2s. However, additional background samples may support the argument that arsenic concentrations detected at OU3 are consistent with background conditions in central New Jersey.

5.6.2. Fate and Transport Modeling

This BHHRA relies on certain assumptions regarding the fate and transport of chemicals in groundwater and the potential for vapor migration from groundwater to indoor and outdoor air. EPCs for the volatile COPCs in indoor air (e.g., bathroom or building air) were estimated using screening-level emission/release calculations and atmospheric dispersion modeling. Due to their relative simplicity, these calculations and models tend to overestimate these processes. For example, source depletion over time (e.g., through COPC release or environmental degradation) was not accounted for. Uncertainty associated with such modeling is related to the accuracy with which environmental conditions and processes are simulated. Overall, the inhalation exposure scenarios were modeled in ways that likely overestimate the potential for exposure and adverse health effects.

Evaluation of the entire aquifer exposure unit assumes that groundwater in all of the wells, across all sampled depths, is in communication, and that derivation of an EPC using all of the groundwater data (with the exception of ERT-8) approximates the true average concentration of a COPC in groundwater across the Site. Depending on how well this conceptual understanding of groundwater flow approximates reality, the potential for exposure and adverse health effects may have been under- or overestimated to an unknown degree.

The RI Report presents lines of evidence suggesting the former CDE facility is not the source of impacts in monitoring wells ERT-5, ERT-6, and MW-18 (located within the Pitt Street Well Contamination Area, west of the former CDE facility). However, the results are not conclusive. Therefore, data from these wells were included in the "entire aquifer" and "shallow offsite groundwater, south of Bound Brook" data sets evaluated in this BHHRA. To determine the relative contribution that groundwater data from these wells make to the baseline cancer risks and non-cancer hazards, the following presents an evaluation of groundwater data from only ERT-5, ERT-6 and MW-18.

Appendix G, Table G-1 presents the analytical data from groundwater samples collected from these three wells in October 2009 and March/April 2010. The sample results are limited to the chemicals that were identified as COPCs in the entire aquifer (See RAGS Part D Table 2.1) or shallow offsite groundwater, south of Bound Brook (See RAGS Part D Table 2.3) data sets and that were also detected in any of the three wells. A data summary, including the frequency of detection and range of detected concentrations, is presented for each COPC. Table G-1 also presents EPCs calculated for each COPC, using only the data from ERT-5, ERT-6 and MW-18 samples. These EPCs were used in the same intake/exposure calculations presented in RAGS Part D Table 7.1RME, Table 7.5RME, and Table 7.6RME and cancer risks and non-cancer hazards were estimated for, respectively, the commercial/industrial worker, resident adult, and resident child.

Table G-2 presents the cancer risks and non-cancer hazards estimated for each receptor. As shown, the cancer risks range from 5E-04 for the commercial/industrial worker to 1E-03 for the resident adult and resident child. These cancer risks are all greater than the risk range established by the NCP. The non-cancer hazards range from 1E+00 for the commercial/industrial worker to 1E+01 for the resident child. The HIs for the resident adult (5E+00) and resident child are greater than the target HI of 1E+00. Table G-2 also notes the COPCs that are the predominant contributors to these cancer risks and non-cancer hazards. The greatest contributors to the cancer risks estimated using data from ERT-5, ERT-6 and MW-18 only were dibenzo(a,h)anthracene and arsenic. The only COPCs that indicated a potential for non-cancer hazard were total PCB Aroclors and arsenic. Based on this evaluation, a portion of the potential for cancer risk and non-cancer hazard indicated in the baseline evaluation is attributable to concentrations of dibenzo(a,h)anthracene, total PCB Aroclors, and arsenic detected in ERT-5, ERT-6, and MW-18.

5.6.3. Human Exposure Modeling

The exposure assessment relies on a series of assumptions regarding the potential for human exposure, outlined in the CSM and approximated in the daily intake calculation by parameters such as the groundwater EPC and receptor-specific exposure duration, frequency, and time. This BHHRA attempted to address some of the uncertainty in these assumptions by conservatively evaluating the potential for cancer risk and non-cancer hazard to individuals under RME conditions in the current/future and future exposure scenarios. The assessment primarily relied on the USEPA's standard default exposure assumptions which are used at Superfund sites across the country with appropriate modifications to reflect site-specific conditions. The intention is to over-estimate the potential for risk and hazards, so that actual risks are less than those predicted in this BHHRA.

The number of non-detected chemicals in a data set and the treatment of non-detects in the statistical evaluation of the data (i.e., substitution of the full sample reporting limit) may result in uncertainty in the calculated EPCs for some COPCs. As a result, the EPCs may be underestimated or overestimated. The EPCs used in the exposure assessment (i.e., the 95% UCL on the arithmetic average concentration or the maximum detected concentration) were estimated without consideration of environmental migration, transformation, degradation, or loss and should result in overestimates of long-term exposure.

While aspects of the exposure assessment methodology can result in over-estimates or under-estimates of human exposure, exposure is probably overestimated, overall, for the potentially exposed populations evaluated.

5.6.4. Available Toxicity Values

The derivation of the toxicity values that form the basis of the risk characterization can result in overestimates or underestimates of the potential for adverse health effects. In most cases, the toxicity values are derived from extrapolation from laboratory animal data to humans. As indicated in RAGS Part D Tables 5.1 and 5.2, the oral RfDs and inhalation RfCs contain modifying and/or uncertainty factors that range from 1.5 to 3,000.

RfDs and cancer slope factors for oral exposure were adjusted and used to assess risks from dermal absorption. While this adjustment follows USEPA guidance, oral absorption for the organic COPCs was assumed to be 100 percent which may underestimate dermal contact exposure for some chemicals. For those chemicals with specific oral absorption factors, consideration was not given to the absorption efficiency of the exposure vehicle used in the studies on which the factors are based. This may overestimate or underestimate dermal contact risks for some chemicals.

For benzene, where the USEPA provides a range of cancer potency, the more conservative (i.e., health protective) oral and inhalation cancer slope factors were used.

Finally, for some chemicals, health criteria are insufficient to determine RfDs or slope factors for oral and/or inhalation exposure. As a result, the risk estimates may be underestimated. Toxicity values (i.e., RfDs, RfCs, cancer slope factors, and unit risk factors for assessing oral and inhalation exposure) were not available for the following COPCs: benzo(g,h,i)perylene, phenanthrene, delta-BHC, endosulfan sulfate, and endrin aldehyde. A brief summary of adverse health effects associated with exposure to each of these these chemicals was presented in Section 5.5.

At the present time, scientists with the USEPA's IRIS Program are evaluating the toxicity of some chemicals that were identified as COPCs in groundwater, including benzo(a)pyrene, naphthalene, and TCE (see IRIS Track at www.epa.gov/iris). This may result in modification to the toxicity values used in this BHHRA. Therefore, the toxicity values used herein may result in either an underestimate or overestimate of the cancer risks and non-cancer HIs.

6. Summary of BHHRA

The incremental lifetime cancer risks estimated under the RME scenarios evaluated in this BHHRA ranged from 8E-07 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 7E-03 for resident adult exposure to the entire aquifer. The incremental lifetime cancer risks estimated using CTE assumptions ranged from 2E-07 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 1E-03 for resident child exposure to the entire aquifer.

Under both the RME and CTE scenarios, the incremental lifetime cancer risks for commercial/industrial worker, resident adult, and resident child exposure to the entire aquifer were greater than the cancer risk range of 10^{-4} to 10^{-6} established by the NCP. The potential for cancer risk indicated for commercial/industrial workers was largely attributable to concentrations of TCE in the entire aquifer, while cancer risks for the resident adult and resident child were primarily attributable to concentrations of TCE and arsenic in the entire aquifer. However, concentrations of other chemicals in the entire aquifer [i.e., tetrachloroethene, vinyl chloride, total PCB Arocolors, dibenzo(a,h)anthracene, heptachlor, and 2,3,7,8-TCDD TEQ] also resulted in cancer risks greater than the risk range established by the NCP. The cancer risks estimated for the construction/utility worker were less than or within the risk range established by the NCP for all three shallow groundwater exposure units.

Non-cancer HIs estimated under the RME scenarios ranged from 3E+00 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 7E+02 for resident child exposure to the entire aquifer. Non-cancer HIs estimated using CTE assumptions ranged from 3E+00 for the construction/utility worker exposure to shallow offsite groundwater, north of Bound Brook to 4E+02 for resident child exposure to the entire aquifer.

Under both the RME and CTE scenarios, the non-cancer HIs were greater than 1E+00 for all potential human receptors, indicating there is a potential for adverse, non-cancer health effects from exposure to groundwater. For all receptors evaluated, the potential for adverse, non-cancer health effects was indicated for total PCB Aroclors. For the resident adult and resident child, the predominant contributor to the non-cancer hazard is cis-1,2-

dichloroethene. However, concentrations of 1,2,4-trichlorobenzene, 2,3,7,8-TCDD TEQ, and arsenic also resulted in non-cancer HIs greater than 1E+00.

The results of the alternate evaluation, in which COPC concentrations detected in MW-06, MW-11, MW-12, and MW-14S (ports 1 through 4) were removed from the entire aquifer data set, revealed that a portion of the baseline cancer risks and non-cancer hazards can be explained by relatively elevated concentrations in a few onsite monitoring wells. However, the total cancer risks and non-cancer hazards were still greater than, respectively, the risk range established by the NCP and the target non-cancer HI of 1E+00. In addition, even after excluding these concentrations from the entire aquifer data set, a variety of COPCs had one or more elevated concentrations compared to federal or NJDEP MCLs: 13 VOCs, three SVOCs, five pesticides, PCB Aroclors, and eight metals.

The alternate evaluation also demonstrated that selective removal of the pesticide and PCB concentrations greater than aqueous solubility prior to calculation of the EPCs used to calculate baseline risks and hazards is not likely to affect the RI conclusions overall. Pesticide contamination is not widespread throughout OU3 and unacceptable risks and hazards from total PCB Aroclors and 2,3,7,8-TCDD TEQ are indicated even without the influence of the most elevated concentrations. Selective removal of the most elevated pesticide concentrations was also reasonable, considering these chemicals are not primary Site-related contaminants and such elevated concentrations are not likely migrating outside the boundary of the former CDE facility.

The primary Site-related contaminants are chlorinated VOCs and PCBs. This BHHRA confirmed there is a potential for unacceptable cancer risk and non-cancer hazard from exposure to concentrations of TCE and its degradation products (e.g., cis-1,2-dichloroethene and vinyl chloride), total PCB Aroclors, and 2,3,7,8-TCDD TEQ in groundwater. The potential for risk indicated for residential exposure to arsenic in the entire aquifer is likely attributable to background conditions in central New Jersey.

Lastly, the evaluation of groundwater data from only the sidegradient wells ERT-5, ERT-6, and MW-18 indicated a potential source area other than the former CDE facility; this evaluation, however, was not conclusive.

For the evaluation of the potential for adverse health effects from resident child exposure to lead in drinking water (using the entire aquifer data set), the geometric mean PbB concentration estimated using the IEUBK model is 2.6 μg/dL. The probability that the PbB concentration is greater than 10 μg/dL is 0.22 percent. Therefore, lead concentrations in groundwater (entire aquifer) should not pose a risk to resident children or, by extension, to resident adults.

7. References

Agency for Toxic Substances and Disease Registry. 2009. Minimal Risk Levels for Hazardous Substances. Accessed online: http://www.atsdr.cdc.gov/mrls/index.asp

Agency for Toxic Substances and Disease Registry. 2007. Toxicological Profile for Lead. U.S. Public Health Service, Atlanta, GA. (August 2007)

Agency for Toxic Substances and Disease Registry. 2005. Toxicological Profile for Hexachlorocyclohexane. U.S. Public Health Service, Atlanta, GA. (August 2005)

Agency for Toxic Substances and Disease Registry. 2000. Toxicological Profile for Endosulfan. U.S. Public Health Service, Atlanta, GA. (September 2000)

Agency for Toxic Substances and Disease Registry. 1996. Toxicological Profile for Endrin. U.S. Public Health Service, Atlanta, GA. (August 1996)

Agency for Toxic Substances and Disease Registry. 1995. Toxicological Profile for Polycyclic Aromatic Hydrocarbons. U.S. Public Health Service, Atlanta, GA. (August 1995)

Fenneman, N.M. 1938. Physiography of Eastern United States. New York: McGraw-Hill.

Foster Wheeler Environmental Corporation. 2002. Final Remedial Investigation Report for Operable Unit 2 (OU-2) On-Site Soils and Buildings for Cornell-Dubilier Electronics Superfund Site - South Plainfield, Middlesex County, New Jersey.

Foster Wheeler Environmental Corporation. 2001a. Data Evaluation Report for Cornell-Dubilier Electronics Superfund Site. South Plainfield, Middlesex County, New Jersey.

Foster Wheeler Environmental Corporation. 2001b. Remedial Investigation Report for OU1, Cornell-Dubilier Electronics Superfund Site. South Plainfield, Middlesex County, New Jersey.

Malcolm Pirnie, Inc. 2008a. Cornell-Dubilier Electronics Superfund Site, Quality Assurance Project Plan, OU3 Groundwater. (December 2008)

Malcolm Pirnie, Inc. 2008b. Final Remedial Investigation/Feasibility Study Work Plan. Cornell-Dubilier Electronics Superfund Site, South Plainfield, New Jersey. Operable Unit 3: Groundwater. (December 2008)

Michalski, A. 1990. Hydrogeology of Brunswick (Passaic) Formation and implications for Groundwater Monitoring Practices. Groundwater Monitoring Review. Vol. 1 (4): 134-43.

Michalski, A. and R. Britton. 1997. The Role of Bedding Fractures in the Hydrogeology of Sedimentary Bedrock - Evidence from the Newark Basin, New Jersey. Ground Water. Vol. 35 (2): 318-327.

Michalski, A. and G.M. Klepp. 1990. Characterization of Transmissive Fractures by Simple Tracing of In-Well Flow. Ground Water. Vol. 28 (2): 191-198.

National Research Council. 1983. Risk Assessment in the Federal Government: Managing the Process. National Academy Press: Washington, DC. 191 pp.

New Jersey Geological Survey, 2004. Arsenic in New Jersey ground water. *Information Circular*. http://www.state.nj.us/dep/njgs/enviroed/infocirc/arsenic.pdf.

Schaum, J., K. Hoang, R. Kinerson, and J. Moya. 1992. Estimating Dermal and Inhalation Exposure to Volatile Chemicals in Domestic Water. California Environmental Protection Agency. Sacramento, CA.

Stern, A.H. 2009. Derivation of an Ingestion-Based Soil Remediation Criterion for Cr+6 Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate. New Jersey Department of Environmental Protection, Office of Science, Trenton, NJ. (June 2009)

U.S. Department of Energy. 2011. Risk Assessment Information System. Chemical parameters tool. Oak Ridge National Laboratory. Accessed online: http://rais.ornl.gov/

U.S. Environmental Protection Agency. 2011a. Regional Screening Levels for Tapwater. (May 2011) Accessed online: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.

U.S. Environmental Protection Agency. 2011b. Integrated Risk Information System. Accessed online: http://www.epa.gov/IRIS/

U.S. Environmental Protection Agency. 2011c. Regional Screening Levels User's Guide. Accessed online: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm

U.S. Environmental Protection Agency. 2010a. ProUCL Version 4.00.05 Technical Guide (Draft). EPA/600/R-07/041. Office of Research and Development, Washington, DC. (May 2010)

U.S. Environmental Protection Agency. 2010b. Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds. EPA/100/R-10/005. Risk Assessment Forum,Washington, DC. (December 2010)

U.S. Environmental Protection Agency. 2009a. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment). Final. EPA-540-R-070-002. Office of Superfund Remediation and Technology Innovation, Washington, DC. (January 2009)

U.S. Environmental Protection Agency. 2009b. Transmittal of Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. Memorandum. Incorporated into OSWER 9200.2-82. (June 2009)

U.S. Environmental Protection Agency. 2009c. Draft Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at CERCLA and RCRA Sites. OSWER 9200.3-56. Office of Superfund Remediation and Technology Innovation, Washington, DC. (December 2009)

U.S. Environmental Protection Agency. 2009d. Lead Risk Assessment. Accessed online: http://www.epa.gov/superfund/health/contaminants/lead/pbrisk.htm. See also the Technical Review Workgroup (TRW) for Metals and Asbestos webpage at http://www.epa.gov/superfund/health/contaminants/lead/trw.htm

U.S. Environmental Protection Agency. 2008. Child-Specific Exposure Factors Handbook. EPA/600/R-06/096F. Office of Research and Development, Washington, DC. (September 2008)

U.S. Environmental Protection Agency. 2005a. Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens. EPA/630/R-03/003F. Risk Assessment Forum, Washington, DC. (March 2005)

U.S. Environmental Protection Agency. 2005b. Guidelines for Carcinogen Risk Assessment. EPA/630/P-03/001F. Risk Assessment Forum, Washington, DC. (May 2005)

U.S. Environmental Protection Agency. 2004. Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final. EPA/540/R/99/005. Office of Superfund Remediation and Technology Innovation, Washington, DC. (July 2004)

U.S. Environmental Protection Agency. 2003a. Personal communication with USEPA, Region 2 Superfund Program, Program Support Branch, Technical Support Team Leader.

U.S. Environmental Protection Agency. 2003b. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. Office of Emergency and Remedial Response, Washington, DC. (June 2003)

U.S. Environmental Protection Agency. 2003c. Human Health Toxicity Values in Superfund Risk Assessments. OSWER Directive 9285.7-53. Office of Solid Waste and Emergency Response, Washington, DC. (5 December 2003)

U.S. Environmental Protection Agency. 2002a. User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Window® Version - 32 Bit Version. EPA540-K-01-005. Office of Solid Waste and Emergency Response, Washington, DC. (May 2002)

U.S. Environmental Protection Agency. 2002b. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. Office of Solid Waste and Emergency Response, Washington, DC. (December 2002)

U.S. Environmental Protection Agency. 2001. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments). Final. Publication 9285.7-47. Office of Emergency and Remedial Response, Washington, DC. (December 2001)

U.S. Environmental Protection Agency. 1999. Guidelines for Carcinogen Risk Assessment. Review Draft. NCEA-F-0644. Risk Assessment Forum, Washington, DC. (July 1999)

U.S. Environmental Protection Agency. 1997a. Health Effects Assessment Summary Tables. FY 1997 Update. EPA-540-R-97-036. Office of Solid Waste and Emergency Response, Washington, DC. (July 1997)

U.S. Environmental Protection Agency. 1997b. Exposure Factors Handbook. EPA/600/P-95/002Fa. Office of Health and Environmental Assessment, Washington, DC. (August 1997)

U.S. Environmental Protection Agency. 1996a. Proposed Guidelines for Carcinogen Risk Assessment. EPA/600/P-92/003C. Office of Research and Development, Washington, DC. (April 1996)

U.S. Environmental Protection Agency. 1996b. Soil Screening Level Guidance: Technical Background Document. Part 5: Chemical-specific Parameters. EPA/540/R95/128. Office of Solid Waste and Emergency Response, Washington, DC. (May 1996)

U.S. Environmental Protection Agency. 1995a. Guidance for Risk Characterization. Science Policy Council. Washington, DC. (February 1995)

U.S. Environmental Protection Agency. 1995b. Guideline for Predictive Baseline Emissions Estimation for Superfund Sites. Interim Final. EPA-451/R-96-001. Air/Superfund National Technical Guidance Study Series. Office of Air Quality Planning and Standards, Research Triangle Park, NC. (November 1995).

U.S. Environmental Protection Agency. 1994. Guidance Manual for the IEUBK Model for Lead in Children. OSWER #9285.7-15-1. Office of Solid Waste and Emergency Response, Washington, DC. (February 1994)

U.S. Environmental Protection Agency. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93/089. Office of Research and Development, Washington, DC. (July 1993)

U.S. Environmental Protection Agency. 1992a. Supplemental Guidance to RAGS: Calculating the Concentration Term. Publication 9285.7-08. Office of Solid Waste and Emergency Response, Washington, DC. (May 1992)

U.S. Environmental Protection Agency. 1992b. PAL2.1: A Gaussian-Plume Algorithm for Point, Area, and Line Sources. Version 89272.

U.S. Environmental Protection Agency. 1991. Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual. Supplemental Guidance. "Standard

Default Exposure Factors." Interim Final. OSWER Directive: 9285.6-03. Office of Emergency and Remedial Response, Washington, DC. (March 1991)

U.S. Environmental Protection Agency. 1990. National Oil and Hazardous Substances Pollution Contingency Plan. Final Rule. 40 CFR Part 300. Federal Register. 55(46): 8665-8866. (March 1990)

U.S. Environmental Protection Agency. 1989. Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002. Office of Emergency and Remedial Response, Washington, DC. (December 1989)

U.S. Environmental Protection Agency. 1986. Guidelines for Carcinogen Risk Assessment. EPA/630/R-00/004. Risk Assessment Forum, Washington, DC. (September 1986)

U.S. Environmental Protection Agency. 1985. Health Assessment Document for Polychlorinated Dibenzo-p-Dioxins. EPA/600/8-84-014F. Office of Health and Environmental Assessment, Washington, DC. (September 1985)

U.S. Environmental Protection Agency, Region 2. 2011. Personal communication with USEPA Region 2 Superfund Program, Program Support Branch, Technical Support Team Leader (March 2011).

Table 2-1
Groundwater Monitoring Wells and Screened Intervals
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Well ID	Single Screen or FLUTe™ Well Sampler Port #	Depth (feet bgs) of Screened Interval	
		Top	Bottom
Shallow Bedrock Monitoring Wells			
MW-01A	1	24	49
MW-02A	1	24	49
MW-03	1	17	32
MW-04	1	29	49
MW-05	1	25	45.5
MW-06	1	29	44
MW-07	1	43	58
MW-08	1	42	57.5
MW-09	1	29	54
MW-10	1	37	52
MW-11	1	34	59
MW-12	1	35	60
Deep Bedrock Multi-Port Monitoring Wells			
ERT-1	1	24	29
	2	33	43
	3	46	56
	4	59	64
	5	67	77
	6	100	105
	7	112	117
	8	135	140
ERT-2	1	25	35
	2	40	50
	3	54	59
	4	70	75
	5	97	107
	6	113	123
	7	127	137
ERT-3	1	27	37
	2	55	65
	3	90	105
	4	110	120
	5	124	134
	6	138	148
ERT-4	1	27	37
	2	46	56
	3	61	66
	4	83	88
	5	91	106
	6	111	116
	7	128	138
ERT-5	1	24	34
	2	37	47
	3	50	60
	4	77	87
	5	93	98
	6	120	130

Table 2-1
Groundwater Monitoring Wells and Screened Intervals
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Well ID	Single Screen or FLUTe™ Well Sampler Port #	Depth (feet bgs) of Screened Interval	
		Top	Bottom
ERT-6	1	26	36
	2	75	85
	3	93	103
	4	107	117
	5	128	138
ERT-7	1	25	35
	2	45	55
	3	65	75
	4	100	110
	5	130	140
ERT-8	1	17	27
	2	31	41
	3	44	54
	4	57	62
	5	87	97
	6	107	112
	7	135	145
MW-13	1	18	28
	2	35	45
	3	63	73
	4	95	105
	5	115	125
	6	150	160
	7	230	240
MW-14S	1	30	35
	2	41	46
	3	55	60
	4	65	70
MW-14D	1	80	85
	2	123	133
	3	199	209
MW-15S	1	30	40
	2	70	80
MW-15D	1	125	135
	2	185	195
MW-16	1	20	30
	2	40	50
	3	85	95
	4	108	118
	5	135	145
	6	170	180
	7	195	205
MW-17	1	170	180
	2	205	215
	3	235	245
MW-18	1	160	170
	2	210	220

Table 2-1
Groundwater Monitoring Wells and Screened Intervals
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Well ID	Single Screen or FLUTe™ Well Sampler Port #	Depth (feet bgs) of Screened Interval	
		Top	Bottom
MW-19	1	65	75
	2	132	142
	3	200	210
	4	257	267
	5	367	377
	6	480	490
	7	545	555
MW-20	1	25	35
	2	85	95
	3	125	135
	4	175	185
	5	205	215
	6	250	260
	7	297	307
	8	355	365
MW-21	1	50	60
	2	87	97
	3	150	160
	4	205	215
	5	260	270
	6	428	438
	7	485	495
	8	505	515
MW-22	1	45	55
	2	125	135
	3	210	220
	4	305	315
MW-23	1	60	70
	2	120	130
	3	170	180
	4	226	236
	5	258	268
	6	316	326
	7	350	360
	8	406	416
	9	444	454
Former Production Well	1	31	41
	2	46	51
	3	100	110
	4	125	135
	5	180	190
	6	200	205
	7	235	245
	8	268	278
	9	300	310

Notes:
Shallow bedrock wells or muti-port well sampler ports shaded gray indicate groundwater samples from these wells or ports were analyzed for PCB congeners and dioxins/furans.

Table 2-2
Summary of Sample Analytical Methods and Data Validation
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Groundwater Sampling Event Date	Analytical Fraction	Analytical Method *	Data Validation
October 2009, December 2010, and March 2011	TCL Volatile Organic Compounds (VOC) TCL Semi-Volatile Organic Compounds (SVOC) TCL Pesticides Polychlorinated biphenyls (PCB) Aroclors	SOM01.2	CLP data validation by USEPA, Region 2 Hazardous Waste Support Branch
	TAL Metals, Mercury (Hg), Cyanide (CN)	ILM05.4	
March-April 2010	TCL VOCs TCL SVOCs TCL Pesticides PCB Aroclors	SOM01.2	
	PCB Congeners	CBC01.0	
	TCL Dioxins/Furans	DLM02.0	
	TAL Metals, Hg, CN	ILM05.4	
July 2010	PCB Congeners	CBC01.0	
	TCL Dioxins/Furans	DLM02.0	

Notes
TCL = Target Compound List, as specified in EPA Method SOM01.2, USEPA OSWER Document 9200.5-171-FS (August 2007).
TAL = Target Analyte List, as specified in EPA Method ILM05.4, USEPA OSWER Document 9200.5-170-FS (January 2007).
*Analytical methods follow USEPA Contract Laboratory Program (CLP) statements of work.

Table 2-3
Evaluation of Reporting Limits for Chemicals Not Detected in Groundwater
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

CAS Number	Chemical	Range of Detection Limits [1] (µg/L)	USEPA RSL for Tapwater [2] (µg/L)	Basis	Maximum Reporting Limit > RSL? [Y / N]	Frequency of Reporting Limit > RSL? (%)	Range of Risk-based Screening Levels noncancer HQ=0.1 (µg/L)	noncancer HQ=1 (µg/L)	cancer 10^{-6} (µg/L)	cancer 10^{-4} (µg/L)
Volatile Organic Compounds										
74-97-5	Bromochloromethane	0.5 - 500	8.3	nc	Y	33	0.83	8.3		
74-83-9	Bromomethane	0.5 - 500	0.87	nc	Y	18	0.87	8.7		
75-15-0	Carbon disulfide	0.5 - 500	100	nc	Y	2	100	1,000		
75-00-3	Chloroethane	0.5 - 500	2,100	nc	N	Does not exceed	2,100	21,000		
75-71-8	Dichlorodifluoromethane	0.5 - 500	20	nc	Y	24	20	200		
78-87-5	1,2-Dichloropropane	0.5 - 500	0.39	ca	Y	100			0.39	39
10061-01-5	cis-1,3-Dichloropropene	0.5 - 500	0.43 [a]	ca	Y	100			0.43	43
542-75-6	trans-1,3-Dichloropropene	0.5 - 500	0.43 [a]	ca	Y	100			0.43	43
591-78-6	2-Hexanone	5 - 5,000	4.7	nc	Y	100	4.7	47		
108-10-1	4-Methyl-2-pentanone	5 - 5,000	200	nc	Y	5	200	2,000		
100-42-5	Styrene	0.5 - 500	160	nc	Y	2	160	1,600		
79-34-5	1,1,2,2-Tetrachloroethane	0.5 - 500	0.067	ca	Y	100			0.067	6.7
Semi-Volatile Organic Compounds										
208-96-8	Acenaphthylene	0.1-0.11	NA		--	--				
1912-24-9	Atrazine	5-5.6	0.29	ca	Y	100			0.29	29
111-91-1	Bis(2-chloroethoxy)methane	5-5.6	11	nc	N	Does not exceed	11	110		
111-44-4	Bis(2-chloroethyl)ether	5-5.6	0.012	ca	Y	100			0.012	1.2
101-55-3	4-Bromophenyl phenyl ether	5-5.6	NA		--	--				
85-68-7	Butylbenzylphthalate	5-5.6	35	ca	N	Does not exceed			35	3,500
59-50-7	4-Chloro-3-methylphenol	5-5.6	370	nc	N	Does not exceed	370	3,700		
106-47-8	4-Chloroaniline	5-5.6	0.34	ca	Y	100			0.34	34
91-58-7	2-Chloronaphthalene	5-5.6	290	nc	N	Does not exceed	290	2,900		
7005-72-3	4-Chlorophenyl phenyl ether	5-5.6	NA		--	--				
132-64-9	Dibenzofuran	5-5.6	3.7	nc	Y	100	3.7	37		
91-94-1	3,3'-Dichlorobenzidine	5-5.6	0.15	ca	Y	100			0.15	15
105-67-9	2,4-Dimethylphenol	5-5.6	73	nc	N	Does not exceed	73	730		
84-74-2	Di-n-butylphthalate	5-5.6	370	nc	N	Does not exceed	370	3,700		
117-84-0	Di-n-octylphthalate	5-5.6	NA		--	--				
534-52-1	4,6-Dinitro-2-methylphenol	10-11	0.29	nc	Y	100	0.29	2.9		
51-28-5	2,4-Dinitrophenol	10-11	7.3	nc	Y	100	7.3	73		
121-14-2	2,4-Dinitrotoluene	5-5.6	0.22	ca	Y	100			0.22	22
606-20-2	2,6-Dinitrotoluene	5-5.6	3.7	nc	Y	100	3.7	37		
118-74-1	Hexachlorobenzene	5-5.6	0.042	ca	Y	100			0.042	4.2
87-68-3	Hexachlorobutadiene	5-5.6	0.86	ca	Y	100			0.86	86
77-47-4	Hexachlorocyclopentadiene	5-5.6	22	nc	N	Does not exceed	22	220		
67-72-1	Hexachloroethane	5-5.6	3.7	nc	Y	100	3.7	37		
78-59-1	Isophorone	5-5.6	71	ca	N	Does not exceed			71	7,100
95-48-7	2-Methylphenol	5-5.6	180	nc	N	Does not exceed	180	1,800		
106-44-5	4-Methylphenol	5-5.6	18	nc	N	Does not exceed	18	180		
88-74-4	2-Nitroaniline	10-11	37	nc	N	Does not exceed	37	370		
99-09-2	3-Nitroaniline	10-11	NA		--	--				
100-01-6	4-Nitroaniline	10-11	3.4	ca	Y	100			3.4	340
98-95-3	Nitrobenzene	5-5.6	0.12	ca	Y	100			0.12	12
88-75-5	2-Nitrophenol	5-5.6	NA		--	--				
100-02-7	4-Nitrophenol	10-11	NA		--	--				
621-64-7	n-Nitroso-di-n-propylamine	5-5.6	0.0096	ca	Y	100			0.0096	0.96
86-30-6	n-Nitrosodiphenylamine	5-5.6	14	ca	N	Does not exceed			14	1,400
52438-91-2	2,2'-Oxybis(1-chloropropane)	5-5.6	NA		--	--				
58-90-2	2,3,4,6-Tetrachlorophenol	5-5.6	110	nc	N	Does not exceed	110	1,100		
95-95-4	2,4,5-Trichlorophenol	5-5.6	370	nc	N	Does not exceed	370	3,700		
88-06-2	2,4,6-Trichlorophenol	5-5.6	3.7	nc	Y	100	3.7	37		
Polychlorinated biphenyls (PCB) Aroclors										
11104-28-2	Aroclor 1221	0.01 - 90	0.0068	ca	Y	100			0.0068	0.68
11141-16-5	Aroclor 1232	0.01 - 90	0.0068	ca	Y	100			0.0068	0.68
53469-21-9	Aroclor 1242	0.01 - 90	0.034	ca	Y	100			0.034	3.4
11096-82-5	Aroclor 1260	0.01 - 90	0.034	ca	Y	100			0.034	3.4
37324-23-5	Aroclor 1262	0.01 - 90	NA		--	--				
11100-14-4	Aroclor 1268	0.01 - 90	NA		--	--				
Pesticides										
309-00-2	Aldrin	0.05 - 26	0.004	ca	Y	100			0.004	0.4
5103-71-9	alpha-Chlordane	0.05 - 26	NA		--	--				
19595-59-6	Endosulfan I	0.05 - 26	NA		--	--				
53494-70-5	Endrin ketone	0.01 - 51	NA		--	--				
8001-35-2	Toxaphene	5 - 2,600	0.061	ca	Y	100			0.061	6.1
Inorganic Compounds										
7440-28-0	Thallium	1 - 2	0.037	nc	Y	100	0.037	0.37		

Notes

[1] Detection limits are equivalent to reporting limits.

[2] The USEPA Regional Screening Levels (RSL) for tapwater are from May 2011 (USEPA, 2011a) and are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

a = RSL is for 1,3-dichloropropene.

NA = Not Available

Table 2-4
Summary of Wells Included in Each Shallow Groundwater Data Set
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Groundwater Data Set	Well ID	Single Screen or FLUTe™ Well Port #	Depth Interval (feet bgs)	
			Top	Bottom
Shallow Onsite	ERT-1	1	24	29
	FPW	1	31	41
	MW-01A	1	24	49
	MW-02A	1	24	49
	MW-03	1	17	32
	MW-04	1	29	49
	MW-05	1	25	45.5
	MW-06	1	29	44
	MW-07	1	43	58
	MW-08	1	42	57.5
	MW-09	1	29	54
	MW-10	1	37	52
	MW-11	1	34	59
	MW-12	1	35	60
	MW-14S	1	30	35
	MW-15S	1	30	40
	MW-16	1	20	30
Shallow Offsite South of Bound Brook	ERT-5	1	24	34
	ERT-6	1	26	36
	ERT-7	1	25	35
	ERT-2	1	25	35
Shallow Offsite North of Bound Brook	ERT-3	1	27	37
	ERT-4	1	27	37
	MW-13	1	18	28
	MW-19	1	65	75
	MW-20	1	25	35
	MW-21	1	50	60
	MW-22	1	45	55
	MW-23	1	31	41

Notes
Groundwater data from ERT-8 were not included because it is an upgradient well representative of background conditions.

Table 2-5
Summary of Chemicals of Potential Concern (COPC) in Groundwater Data Sets
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Groundwater Data Set: Corresponding RAGS Part D Table:	**Entire Aquifer** Table 2.1	**Shallow Onsite Groundwater** Table 2.2	**Shallow Offsite Groundwater South of Bound Brook** Table 2.3	**Shallow Offsite Groundwater North of Bound Brook** Table 2.4
Volatile Organic Chemicals				
Benzene	X	X	X	X
Bromodichloromethane	X	O	--	X
Chlorobenzene	X	X	--	--
Chloroform	X	X	X	X
1,2-Dibromo-3-chloropropane	O	X	--	--
Dibromochloromethane	X	X	X	--
1,2-Dichlorobenzene	X	X	--	--
1,3-Dichlorobenzene	X	X	--	--
1,4-Dichlorobenzene	X	X	--	--
1,1-Dichloroethane	X	X	--	O
1,2-Dichloroethane	X	X	--	--
1,1-Dichloroethene	X	X	--	O
cis-1,2-Dichloroethene	X	X	X	X
trans-1,2-Dichloroethene	X	X	--	--
Ethylbenzene	O	X	--	--
Methyl tert-butyl ether	X	O	X	O
Methylcyclohexane	O	X	--	--
Methylene chloride	X	X	--	O
Tetrachloroethene	X	X	X	X
1,2,3-Trichlorobenzene	X	X	--	--
1,2,4-Trichlorobenzene	X	X	--	--
1,1,2-Trichloroethane	X	X	--	--
Trichloroethene	X	X	X	X
Vinyl chloride	X	X	--	X
o-Xylene	O	X	--	--
Semi-Volatile Organic Chemicals				
Benzo(a)anthracene	O	X	--	--
Benzo(a)pyrene	O	X	--	--
Benzo(b)fluoranthene	O	X	--	--
Benzo(g,h,i)perylene	O	X	--	X
Benzo(k)fluoranthene	O	X	--	--
1,1-Biphenyl	O	X	--	--
Bis(2-ethylhexyl)phthalate	X	O	O	X
Dibenzo(a,h)anthracene	X	X	X	--
Indeno(1,2,3-cd)pyrene	X	X	X	X
Naphthalene	X	X	X	X
Phenanthrene	O	X	--	--
Polychlorinated Biphenyls (PCB) Aroclors and Pesticides				
Total PCB Aroclors	X	X	X	X
alpha-BHC	O	X	--	--
beta-BHC	O	O	--	X
delta-BHC	O	X	--	X
gamma-BHC	O	X	--	--
gamma-Chlordane	X	X	--	--
4,4'-DDD	X	X	--	X
4,4'-DDE	X	X	--	X
4,4'-DDT	X	X	--	X
Dieldrin	O	X	--	--
Endosulfan II	O	X	--	--
Endosulfan sulfate	O	X	--	--
Endrin aldehyde	O	X	--	--
Heptachlor	X	X	--	X
PCB Congeners and Dioxin/Furan Congeners				
2,3,7,8-TCDD Toxic Equivalence	X	X	X	O
Inorganic Chemicals				
Aluminum	X	X	O	O
Antimony	O	O	--	X
Arsenic	X	X	X	X
Barium	X	X	X	O
Cadmium	X	X	--	O
Chromium	X	X	X	X
Cobalt	X	X	O	X
Iron	X	X	O	O
Lead	X	X	O	X
Manganese	X	X	X	X
Vanadium	X	X	O	X

Notes
X = Chemical was identified as a COPC in the corresponding groundwater data set.
O = Chemical was detected but not identified as a COPC in the corresponding groundwater data set.
-- = Chemical was not detected in the corresponding groundwater data set.

Table 7-1
Summary Table: Human Health Cancer Risks and Non-cancer Hazards for RME Scenario
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Exposure Medium	Human Receptor Population	Incremental Lifetime Cancer Risks				Non-Cancer Hazard Indices			
		Exposure Routes			Receptor Total	Exposure Routes			Receptor Total
		Ingestion	Dermal Contact	Inhalation		Ingestion	Dermal Contact	Inhalation	
Entire Aquifer	Commercial/Industrial Worker	N/A	1E-03	3E-03	4E-03	N/A	8E+01	2E+01	9E+01
Shallow Onsite Groundwater	Construction/Utility Worker	N/A	5E-05	5E-08	5E-05	N/A	7E+01	4E-03	7E+01
Shallow Offsite Groundwater, South Bound Brook	Construction/Utility Worker	N/A	3E-05	2E-09	3E-05	N/A	2E+01	4E-05	2E+01
Shallow Offsite Groundwater, North Bound Brook	Construction/Utility Worker	N/A	8E-07	5E-10	8E-07	N/A	3E+00	2E-05	3E+00
Entire Aquifer	Resident Adult	4E-03	2E-03	1E-03	7E-03	2E+02	9E+01	4E+00	3E+02
Entire Aquifer	Resident Child	2E-03	9E-04	5E-04	3E-03	5E+02	2E+02	1E+01	7E+02

Notes
N/A - Not applicable
Cancer risks for the resident adult were calculated as 6 years at the child's rate of exposure and 24 years at the adult's rate of exposure.

Table 7-2
Summary Table: Human Health Cancer Risks and Non-cancer Hazards for CTE Scenario
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Exposure Medium	Human Receptor Population	Incremental Lifetime Cancer Risks				Non-Cancer Hazard Indices			
		Exposure Routes			Receptor Total	Exposure Routes			Receptor Total
		Ingestion	Dermal Contact	Inhalation		Ingestion	Dermal Contact	Inhalation	
Entire Aquifer	Commercial/Industrial Worker	N/A	2E-04	4E-04	6E-04	N/A	6E+01	9E+00	7E+01
Shallow Onsite Groundwater	Construction/Utility Worker	N/A	1E-05	1E-08	1E-05	N/A	6E+01	3E-03	6E+01
Shallow Offsite Groundwater, South Bound Brook	Construction/Utility Worker	N/A	8E-06	6E-10	8E-06	N/A	2E+01	3E-05	2E+01
Shallow Offsite Groundwater, North Bound Brook	Construction/Utility Worker	N/A	2E-07	1E-10	2E-07	N/A	3E+00	2E-05	3E+00
Entire Aquifer	Resident Adult	5E-04	3E-04	5E-05	8E-04	1E+02	6E+01	8E-01	2E+02
Entire Aquifer	Resident Child	8E-04	5E-04	6E-05	1E-03	2E+02	1E+02	1E+00	4E+02

Notes
N/A - Not applicable
Cancer risks for the resident adult were calculated as 6 years at the child's rate of exposure and 24 years at the adult's rate of exposure.

Table 7-3
Qualitative Evaluation of Volatile Chemicals Detected in Shallow Groundwater
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Volatile Chemical Detected in Groundwater	**Henry's Law Constant (H')**	**USEPA Regional Screening Level for Resident Air [1]**	**Shallow Onsite Groundwater**			**Shallow Offsite, South Bound Brook Groundwater**			**Shallow Offsite, North Bound Brook Groundwater**		
			Maximum Detected Concentration [2]	Source Vapor Concentration [3]	Hypothetical Attenuation Factor (Source Vapor-Outdoor Air) [4]	Maximum Detected Concentration [2]	Source Vapor Concentration [3]	Hypothetical Attenuation Factor (Source Vapor-Outdoor Air) [4]	Maximum Detected Concentration [2]	Source Vapor Concentration [3]	Hypothetical Attenuation Factor (Source Vapor-Outdoor Air) [4]
	(unitless)	(µg/m³)	(µg/L)	(µg/m³)	(unitless)	(µg/L)	(µg/m³)	(unitless)	(µg/L)	(µg/m³)	(unitless)
Acetone	1.6E-03	3.2E+04	2.4E+01	3.8E+01	None	ND	--	--	2.3E+02	3.7E+02	None
Benzene	2.3E-01	3.1E-01	2.4E+01	5.5E+03	6E-05	5.0E-01	1.1E+02	3E-03	1.8E+00	4.1E+02	8E-04
Bromodichloromethane	6.6E-02	6.6E-02	4.7E-01	3.1E+01	2E-03	ND	--	--	7.0E-01	4.6E+01	1E-03
Bromoform	2.2E-02	2.2E+00	2.9E+00	6.4E+01	3E-02	1.8E+00	3.9E+01	6E-02	ND	--	--
2-Butanone	2.3E-03	5.2E+03	5.5E+00	1.3E+01	None	ND	--	--	ND	--	--
Chlorobenzene	1.5E-01	5.2E+01	6.5E+01	9.9E+03	5E-03	ND	--	--	ND	--	--
Chloroform	1.5E-01	1.1E-01	1.9E+01	2.9E+03	4E-05	1.1E+00	1.7E+02	7E-04	3.0E+00	4.5E+02	2E-04
Cyclohexane	6.1E+00	6.3E+03	1.3E+01	8.0E+04	8E-02	ND	--	--	ND	--	--
1,2-Dibromo-3-chloropropane	6.0E-03	1.6E-04	3.9E-01	2.3E+00	7E-05	ND	--	--	ND	--	--
Dibromochloromethane	3.2E-02	9.0E-02	1.2E+00	3.9E+01	2E-03	5.1E-01	1.6E+01	5E-03	ND	--	--
1,2-Dibromoethane	2.7E-02	4.1E-03	1.0E-02	2.7E-01	2E-02	ND	--	--	ND	--	--
1,2-Dichlorobenzene	7.8E-02	2.1E+02	5.6E+01	4.4E+03	5E-02	ND	--	--	ND	--	--
1,3-Dichlorobenzene	1.1E-01	NA	1.2E+02	1.3E+04	NA	ND	--	--	ND	--	--
1,4-Dichlorobenzene	1.0E-01	2.2E-01	1.1E+02	1.1E+04	2E-05	ND	--	--	ND	--	--
1,1-Dichloroethane	2.3E-01	1.5E+00	1.1E+01	2.5E+03	6E-04	ND	--	--	2.8E-01	6.4E+01	2E-02
1,2-Dichloroethane	4.0E-02	9.4E-02	1.5E+01	6.0E+02	2E-04	ND	--	--	ND	--	--
1,1-Dichloroethene	1.1E+00	2.1E+02	2.8E+02	3.0E+05	7E-04	ND	--	--	2.2E+00	2.4E+03	9E-02
cis-1,2-Dichloroethene	1.7E-01	NA	3.9E+05	6.5E+07	NA	3.1E+01	5.2E+03	NA	1.1E+02	1.8E+04	NA
trans-1,2-Dichloroethene	3.9E-01	6.3E+01	1.3E+03	5.0E+05	1E-04	ND	--	--	ND	--	--
Ethylbenzene	3.2E-01	9.7E-01	2.0E+01	6.5E+03	2E-04	ND	--	--	ND	--	--
Isopropylbenzene	4.7E-01	4.2E+02	5.1E+00	2.4E+03	2E-01	ND	--	--	ND	--	--
Methyl tert-butyl ether	2.4E-02	9.4E+00	1.3E+00	3.1E+01	3E-01	3.3E+02	7.9E+03	1E-03	4.4E+00	1.1E+02	9E-02
Methylcyclohexane	1.8E+01	NA	4.2E+01	7.4E+05	NA	ND	--	--	ND	--	--
Methylene chloride	9.0E-02	5.2E+00	7.0E+00	6.3E+02	8E-03	ND	--	--	3.3E+00	3.0E+02	2E-02
Naphthalene	2.0E-02	7.2E-02	6.5E+00	1.3E+02	6E-04	1.8E-01	3.6E+00	2E-02	1.6E-01	3.2E+00	2E-02
Tetrachloroethene	7.5E-01	4.1E-01	1.6E+03	1.2E+06	3E-07	1.9E+00	1.4E+03	3E-04	8.1E-01	6.1E+02	7E-04
Toluene	2.7E-01	5.2E+03	5.2E+01	1.4E+04	4E-01	5.2E-01	1.4E+02	None	2.7E+01	7.3E+03	7E-01
1,1,2-Trichloro-1,2,2-trifluoroethane	2.2E+01	3.1E+04	2.2E+00	4.7E+04	7E-01	ND	--	--	ND	--	--
1,2,3-Trichlorobenzene	5.1E-02	NA	2.8E+02	1.4E+04	NA	ND	--	--	ND	--	--
1,2,4-Trichlorobenzene	5.8E-02	2.1E+00	1.6E+03	9.3E+04	2E-05	ND	--	--	ND	--	--
1,1,1-Trichloroethane	7.1E-01	5.2E+03	3.2E-01	2.3E+02	None	ND	--	--	4.1E-01	2.9E+02	None
1,1,2-Trichloroethane	3.7E-02	1.5E-01	1.2E+02	4.5E+03	3E-05	ND	--	--	ND	--	--
Trichloroethene	4.2E-01	1.2E+00	1.7E+05	7.2E+07	2E-08	1.8E+03	7.6E+05	2E-06	3.1E+02	1.3E+05	9E-06
m,p-Xylene	3.0E-01	7.3E+02	1.2E+01	3.6E+03	2E-01	ND	--	--	ND	--	--
o-Xylene	2.1E-01	7.3E+02	8.5E+01	1.8E+04	4E-02	ND	--	--	ND	--	--
Vinyl chloride	1.1E+00	1.6E-01	8.6E+02	9.5E+05	2E-07	ND	--	--	3.6E-01	4.0E+02	4E-04

Note
Sources of Henry's Law Constants are USEPA (1996b) and USDOE (2011).
[1] USEPA RSLs for Resident Air are from November 2010 (USEPA, 2010a) and are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1.
[2] Maximum detected concentrations in the "Shallow Onsite Groundwater," "Shallow Offsite, South Bound Brook Groundwater," and "Shallow Offsite, North Bound Brook Groundwater" data sets are presented in Appendix A, RAGS Part D Tables 2.3, 2.4, and 2.5, respectively.
[3] Source vapor concentrations were calculated using the following equation (USEPA, 2003c): Source vapor (µg/m³) = H' * Max groundwater concentration (µg/L) * 1E+03 L/m³.
[4] Hypothetical attenuation factors (source vapor-outdoor air) were calculated as the ratio of the USEPA RSL for Resident Air to the source vapor concentration.

LEGEND

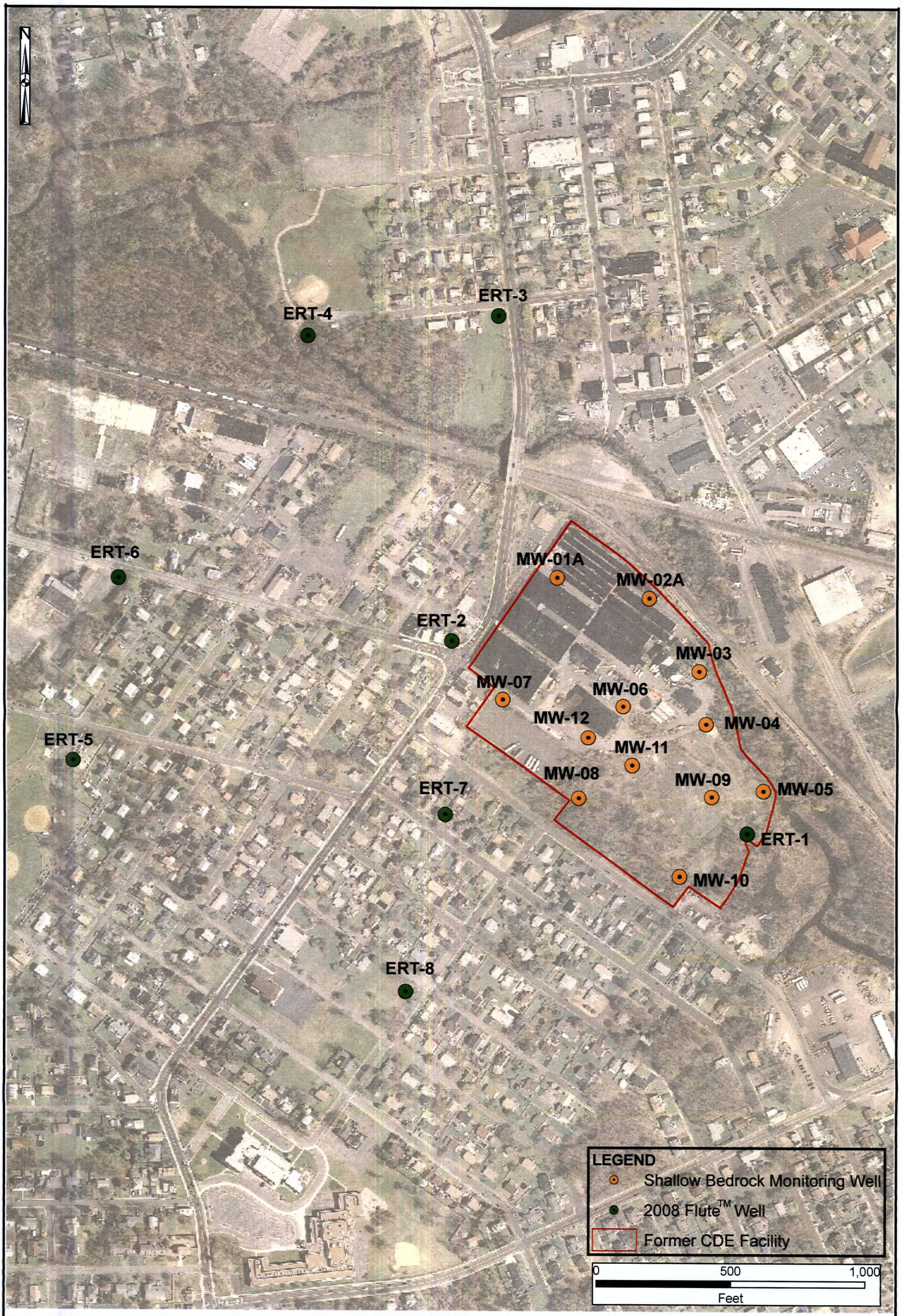
Property Boundary

Bound Brook

0 250 500 1,000 Feet

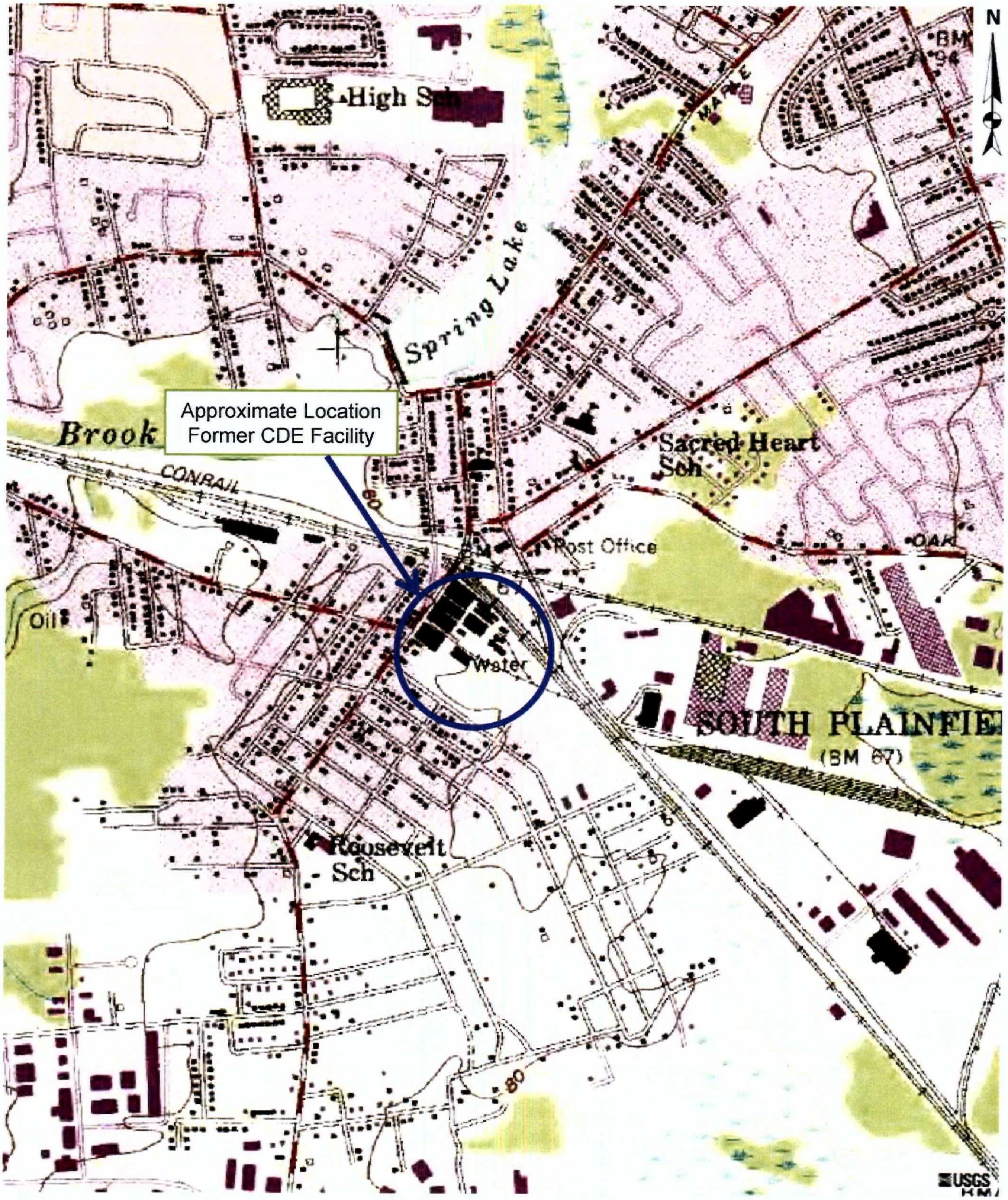
Source: New Jersey Geographic Information Network
(NJ 2007 Ortho Imagery)

MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, NJ	AERIALPHOTOGRAPH	FIGURE 1-1



MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, New Jersey	Groundwater Monitoring Wells from Previous OU3 Investigations	FIGURE 1-2

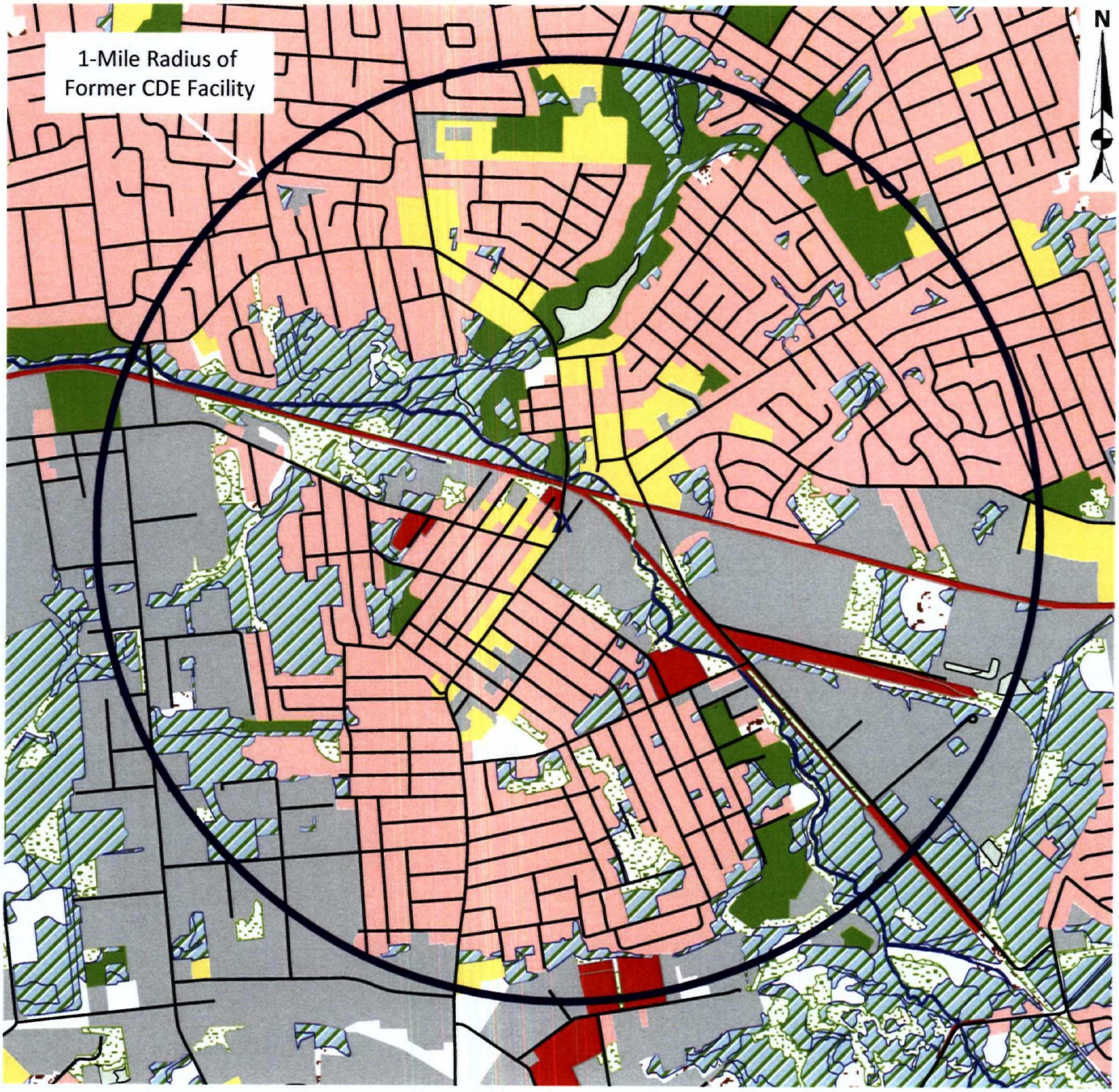
Map Document: (G:\project\4553058\GIS\Mxds\PAR_Fig1.mxd)
1/4/2012 -- 4:15:06 PM



Source: Microsoft Research Maps
(1986 Image)

Scale: 1" = 24,000 feet

MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, NJ	TOPOGRAPHIC MAP	FIGURE 1-3



LEGEND

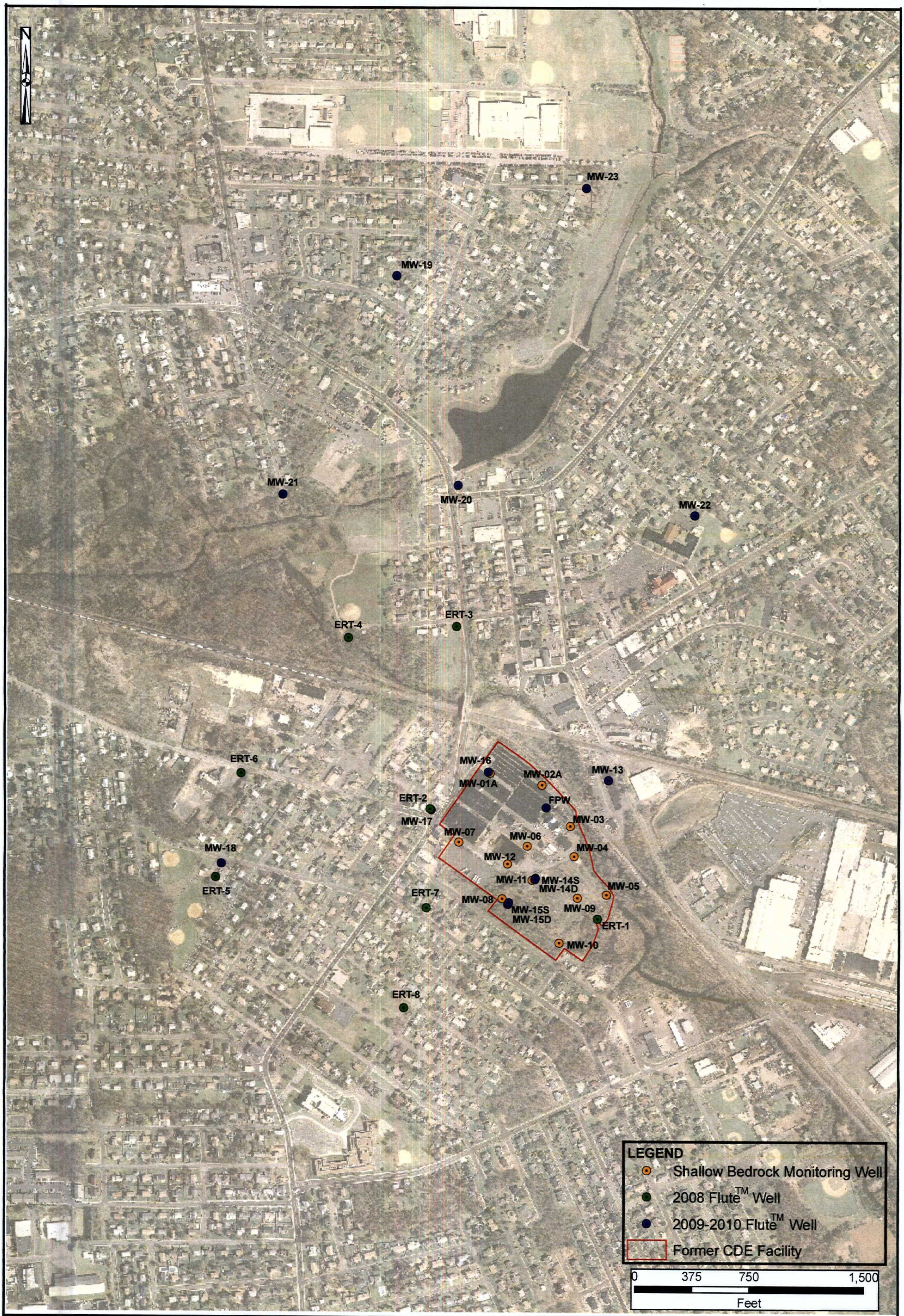
NJDEP 2002 Land Use/Land Cover

- Wetlands
- Natural/Artificial Lakes
- Field/Cemetery
- Commercial/Services
- Scrub/Shrub
- Forested
- Urban/Industrial
- Transportation/Communication
- Residential
- Streams
- Former CDE Facility

Source: NJDEP Bureau of Geographic Information Systems
(Updated as of March 10, 2008)

0 0.25 0.5 1 Miles

MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, NJ	LAND USE / LAND COVER TYPES	FIGURE 1-4



MALCOLM PIRNIE

Cornell-Dubilier Electronics Superfund Site

South Plainfield, New Jersey

OU3 Groundwater Monitoring Well Locations

FIGURE 2-1

Map Document: (G:\project\4553058\GIS\Mxds\PAR_Fig2.mxd)
1/4/2012 -- 4:25:06 PM

Map Document: (G:\project\4553058\GIS\Mxds\BLRA_2-2.mxd)
3/14/2012 -- 4:25:06 PM

MALCOLM PIRNIE

Cornell-Dubilier Electronics Superfund Site

South Plainfield, New Jersey

Shallow Onsite Monitoring Well Locations

FIGURE 2-2

MALCOLM PIRNIE

Cornell-Dubilier Electronics Superfund Site

South Plainfield, New Jersey

Shallow Offsite Monitoring Well Locations, South of Bound Brook

FIGURE 2-3

Map Document: (G:\project\4553058\GIS\Mxds\BLRA_2-3.mxd)
3/14/2012 -- 4:25:06 PM

MALCOLM PIRNIE

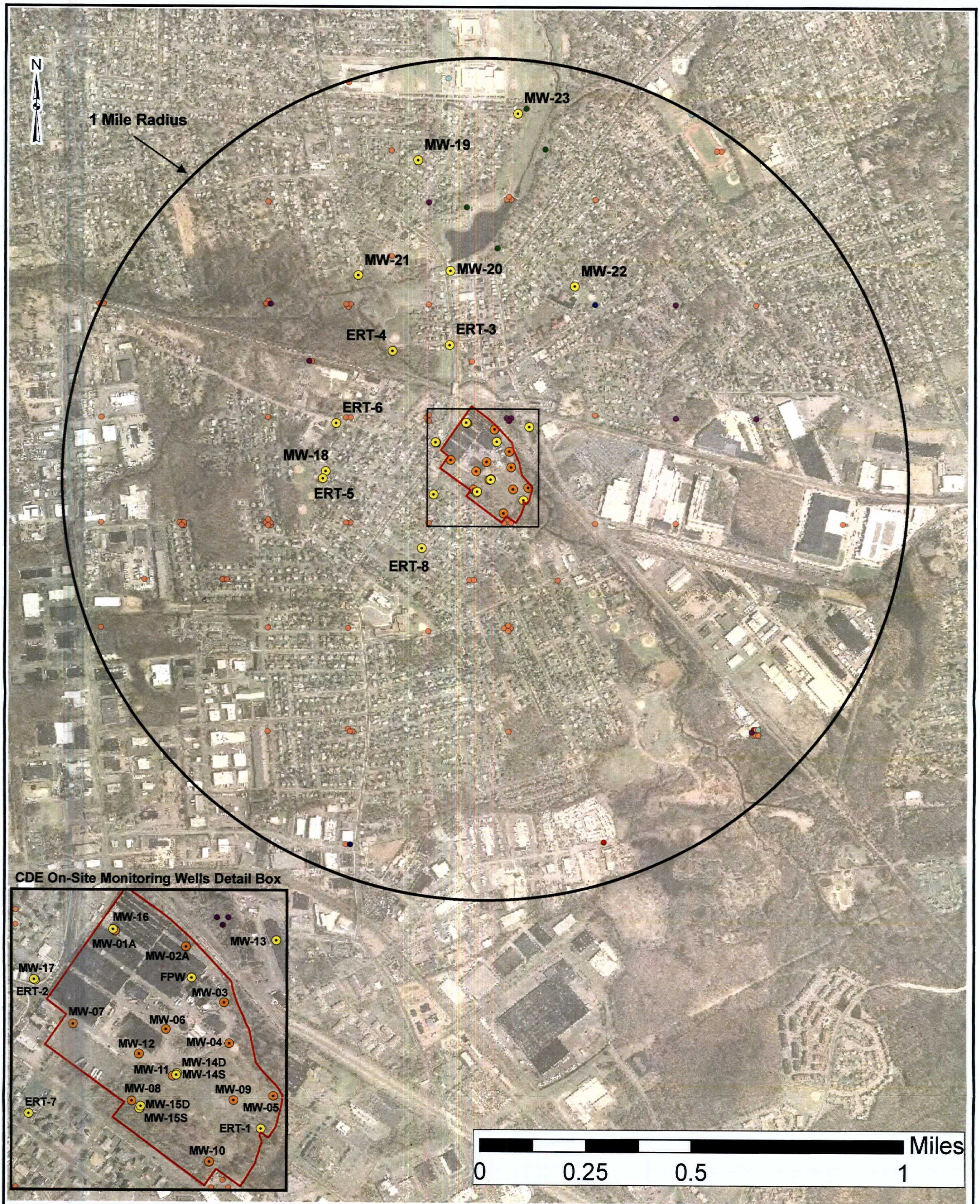
Cornell-Dubilier Electronics Superfund Site

South Plainfield, New Jersey

Shallow Offsite Monitoring Well Locations, North of Bound Brook

FIGURE 2-4

Map Document: (G:\project\4553058\GIS\Mxds\BLRA_2-4.mxd)
3/14/2012 -- 4:25:06 PM



LEGEND

CDE Site Monitoring Wells

- Shallow Bedrock Monitoring Well
- Multiport FLUTe Well

Former CDE Facility

Search Well Type

- Commercial
- Domestic
- Irrigation
- Industrial
- Public Non Community
- Public Supply

MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, New Jersey	1-Mile Radius Well Search Results* *Locations within 1-mile radius from NJDEP Bureau of Water Systems and Well Permitting 1-mile private & 5-mile public well searchs.	FIGURE 3-1

Map Document: (P:\4553058\GIS\Well_Search_RiskAssessmentFinal.mxd)
6/21/2011 -- 1:19:18 PM

APPENDIX A

RAGS Part D Tables

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Entire Aquifer	Within and Outside the Boundaries of the Former CDE Facility - Tap Water and/or Process Water	Commercial / Industrial Worker	Adult	Dermal Contact	Quant	Potable, sanitary, and/or process use of the groundwater.
						Inhalation	Quant	
		Shallow Groundwater	Within and Outside the Boundaries of the Former CDE Facility - Top of the Groundwater Table	Construction/Utility Worker	Adult	Dermal Contact	Quant	Direct contact with bedrock groundwater during construction activities is unlikely. However, groundwater has been observed at depths less than 10 feet below ground surface, and shallow groundwater in the overburden may be hydraulically connected to groundwater in the highly fractured bedrock. This exposure scenario is therefore evaluated using the shallow bedrock groundwater data.
						Inhalation	Quant	
		Entire Aquifer	Outside the Boundaries of the Former CDE Facility - Tap Water	Resident	Adult	Ingestion	Quant	Potable and/or sanitary use of the groundwater.
						Dermal Contact	Quant	
						Inhalation	Quant	
					Child	Ingestion	Quant	Potable and/or sanitary use of the groundwater.
						Dermal Contact	Quant	
						Inhalation	Quant	
		Air	Within and Outside the Boundaries of the Former CDE Facility - Vapors in Indoor Air	Commercial / Industrial Worker	Adult	Inhalation	None	Volatile chemicals in groundwater may enter indoor spaces through building foundations. However, this exposure pathway is being addressed by the USEPA separate from the RI.
			Outside the Boundaries of the Former CDE Facility - Vapors in Indoor Air	Resident	Adult	Inhalation	None	Volatile chemicals in groundwater may enter indoor spaces through building foundations. However, this exposure pathway is being addressed by the USEPA separate from the RI.
					Child	Inhalation	None	
			Within and Outside the Boundaries of the Former CDE Facility - Vapors in Outdoor Air	Commercial / Industrial Worker	Adult	Inhalation	Qual	Volatile chemicals in groundwater may volatilize and be passively released to outdoor air. However, as there are uncertainties associated with quantitatively modeling ambient air concentrations following volatilization from groundwater that may include DNAPL in fractured bedrock, the analysis is qualitative.
				Construction/Utility Worker	Adult	Inhalation	Qual	
			Outside the Boundaries of the Former CDE Facility - Vapor in Outdoor Air	Resident	Adult	Inhalation	Qual	
					Child	Inhalation	Qual	
		Surface Water	Bound Brook	Recreationist	Adolescent	Ingestion	None	Exposure pathways related to surface water and sediment will be addressed in OU4.
						Dermal Contact	None	
						Inhalation	None	
		Sediment	Bound Brook	Recreationist	Adolescent	Ingestion	None	
						Dermal Contact	None	
						Inhalation	None	

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - ENTIRE AQUIFER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Within and Outside the Boundaries of the Former CDE Facility - Process or Tap Water	67-64-1	Acetone	0.82 J	530	µg/L	MW-21-03	53 / 261	5 - 5,000	530	--	2,200	nc	NA	--	N	2
	71-43-2	Benzene	0.13 J	24	µg/L	MW-11	31 / 261	0.5 - 500	24	--	0.41	ca	1	NJDEP MCL	Y	1
	75-27-4	Bromodichloromethane	0.14 J	1.7	µg/L	MW-13-03	23 / 260	0.5 - 500	1.7	--	0.12	ca	80	Federal MCL	Y	1
	75-25-2	Bromoform	0.37 J	2.9	µg/L	MW-03	19 / 258	0.5 - 500	2.9	--	8.5	ca	80	Federal MCL	N	2
	78-93-3	2-Butanone	1.8 J	39	µg/L	MW-14D-02	14 / 257	5 - 5,000	39	--	710	nc	NA	--	N	2
	56-23-5	Carbon tetrachloride	0.25 J	0.72 J	µg/L	MW-16-03	9 / 261	0.5 - 500	0.72	--	0.44	ca	2	NJDEP MCL	N [6]	1,4
	108-90-7	Chlorobenzene	0.21 J	65	µg/L	MW-09	31 / 261	0.5 - 500	65	--	9.1	nc	50	NJDEP MCL	Y	1
	67-66-3	Chloroform	0.24 J	150 J	µg/L	MW-14S-02	97 / 261	0.5 - 500	150	--	0.19	ca	80	Federal MCL	Y	1
	74-87-3	Chloromethane	0.62 J	1.3	µg/L	ERT-1-08	2 / 261	0.5 - 500	1.3	--	19	nc	NA	--	N	2,4
	110-82-7	Cyclohexane	0.2 J	13	µg/L	MW-11	11 / 261	0.5 - 500	13	--	1,300	nc	NA	--	N	2,4
	96-12-8	1,2-Dibromo-3-chloropropane	0.037 J	0.39 J	µg/L	MW-11	9 / 260	0.05 - 0.5	0.39	--	0.00032	ca	0.2	Federal MCL	N [6]	1,4
	124-48-1	Dibromochloromethane	0.21 J	1.2	µg/L	MW-03	18 / 261	0.5 - 500	1.2	--	0.15	ca	80	Federal MCL	Y	1
	106-93-4	1,2-Dibromoethane	--	0.01 J	µg/L	MW-03	1 / 261	0.05 - 500	0.01	--	0.0065	ca	0.05	Federal MCL	N	1,4
	95-50-1	1,2-Dichlorobenzene	0.15 J	56	µg/L	MW-12	25 / 258	0.5 - 500	56	--	37	nc	600	Federal MCL	Y	1
	541-73-1	1,3-Dichlorobenzene	0.015 J	120	µg/L	MW-12	32 / 258	0.5 - 500	120	--	NA		600	NJDEP MCL	Y	5
	106-46-7	1,4-Dichlorobenzene	0.25 J	110	µg/L	MW-12	34 / 258	0.5 - 500	110	--	0.43	ca	75	Federal MCL	Y	1
	75-34-3	1,1-Dichloroethane	0.105 J	26 J	µg/L	FPW-02	67 / 261	0.5 - 500	26	--	2.4	ca	50	NJDEP MCL	Y	1
	107-06-2	1,2-Dichloroethane	0.22 J	15	µg/L	MW-11	27 / 261	0.5 - 500	15	--	0.15	ca	2	NJDEP MCL	Y	1
	75-35-4	1,1-Dichloroethene	0.22 J	280 J	µg/L	MW-11	92 / 261	0.5 - 500	280	--	34	nc	2	NJDEP MCL	Y	1
	156-59-2	cis-1,2-Dichloroethene	0.25 J	390,000 J	µg/L	MW-11	224 / 261	0.5 - 500	390,000	--	7.3	nc	70	Federal MCL	Y	1
	156-60-5	trans-1,2-Dichloroethene	0.11 J	1,300 J	µg/L	MW-11	84 / 261	0.5 - 500	1,300	--	11	nc	100	Federal MCL	Y	1
	100-41-4	Ethylbenzene	0.43 J	20	µg/L	MW-11	5 / 261	0.5 - 500	20	--	1.5	ca	700	Federal MCL	N	1,4
	98-82-8	Isopropylbenzene	0.2 J	5.1 J	µg/L	MW-11	3 / 261	0.5 - 500	5.1	--	68	nc	NA	--	N	2,4
	79-20-9	Methyl acetate	--	3.4 J	µg/L	MW-16-06	1 / 261	0.5 - 500	3.4	--	3,700	nc	NA	--	N	2,4
	1634-04-4	Methyl tert-butyl ether	0.1 J	330	µg/L	ERT-2-01	111 / 261	0.5 - 500	330	--	12	ca	70	NJDEP MCL	Y	1
	108-87-2	Methylcyclohexane	0.14 J	42	µg/L	MW-11	11 / 260	0.5 - 500	42	--	NA		NA	--	N	4,5
	75-09-2	Methylene chloride	0.23 J	7 J	µg/L	MW-11	21 / 261	0.5 - 500	7.0	--	4.8	ca	3	NJDEP MCL	Y	1
	127-18-4	Tetrachloroethene	0.12 J	1,600	µg/L	MW-06	112 / 261	0.5 - 500	1,600	--	0.11	ca	1	NJDEP MCL	Y	1
	108-88-3	Toluene	0.13 J	86	µg/L	MW-21-07	139 / 261	0.5 - 500	86	0.66 - 33 E	230	nc	1,000	Federal MCL	N	2
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.2	2.2	µg/L	MW-01A	3 / 261	0.5 - 500	2.2	--	5,900	nc	NA	--	N	2,4
	87-61-6	1,2,3-Trichlorobenzene	0.12 J	280	µg/L	MW-12	36 / 258	0.5 - 500	280	--	2.9	nc	NA	--	Y	1
	120-82-1	1,2,4-Trichlorobenzene	0.1 J	1,600 J	µg/L	MW-12	44 / 258	0.5 - 500	1,600	--	0.41	nc	9	NJDEP MCL	Y	1
	71-55-6	1,1,1-Trichloroethane	0.062 J	1	µg/L	MW-22-03	23 / 261	0.5 - 500	1.0	--	910	nc	30	NJDEP MCL	N	2
	79-00-5	1,1,2-Trichloroethane	0.27	120	µg/L	MW-11	26 / 261	0.5 - 500	120	--	0.24	ca	3	NJDEP MCL	Y	1
	79-01-6	Trichloroethene	0.28 J	170,000	µg/L	MW-11	237 / 261	0.5 - 500	170,000	0.29 J - 0.54	2.0	ca	1	NJDEP MCL	Y	1
	75-69-4	Trichlorofluoromethane	0.3 J	1.1	µg/L	MW-17-02	4 / 261	0.5 - 500	1.1	--	130	nc	NA	--	N	2,4
	1330-20-7	m,p-Xylene	0.41 J	15	µg/L	MW-17-01	5 / 261	0.5 - 500	15	--	20	nc	1,000	NJDEP MCL	N	2,4
	1330-20-7	o-Xylene	0.33 J	85	µg/L	MW-11	8 / 261	0.5 - 500	85	--	20	nc	1,000	NJDEP MCL	N	1,4
	75-01-4	Vinyl chloride	0.36 J	860 J	µg/L	MW-11	64 / 261	0.5 - 500	860	--	0.016	ca	2	Federal MCL	Y	1

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - ENTIRE AQUIFER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Within and Outside the Boundaries of the Former CDE Facility - Process or Tap Water	83-32-9	Acenaphthene	0.13	0.39	µg/L	MW-02A	5 / 262	0.1-0.11	0.39	--	220	nc	NA	--	N	2,4
	98-86-2	Acetophenone	1.6 J	2.8 J	µg/L	MW-14S-04	2 / 262	5-5.6	2.8	--	370	nc	NA	--	N	2,4
	120-12-7	Anthracene	0.12	0.49 J	µg/L	MW-06	2 / 262	0.1 - 5	0.49	--	1,100	nc	NA	--	N	2,4
	100-52-7	Benzaldehyde	4.2 J	7.2	µg/L	MW-14S-01	2 / 261	5-5.6	7.2	--	370	nc	NA	--	N	2,4
	56-55-3	Benzo(a)anthracene	0.081 J	1.7	µg/L	MW-06	3 / 262	0.1-0.11	1.7	--	0.029	ca	NA	--	N	1,4
	50-32-8	Benzo(a)pyrene	0.14	4.3 J	µg/L	ERT-1-06	7 / 262	0.1 - 5	4.3	--	0.0029	ca	0.2	Federal MCL	N	1,4
	205-99-2	Benzo(b)fluoranthene	0.082 J	3 J	µg/L	ERT-1-06	9 / 261	0.1 - 5	3.0	--	0.029	ca	NA	--	N	1,4
	191-24-2	Benzo(g,h,i)perylene	0.086 J	2.6 J	µg/L	ERT-1-06	12 / 261	0.1 - 5	2.6	--	NA		NA	--	N	4,5
	207-08-9	Benzo(k)fluoranthene	0.091 J	3.5 J	µg/L	ERT-1-06	9 / 262	0.1 - 5	3.5	--	0.29	ca	NA	--	N	1,4
	92-52-4	1,1'-Biphenyl	1.1 J	17	µg/L	MW-14S-04	4 / 262	5-5.6	17	--	0.083	nc	NA	--	N	1,4
	117-81-7	bis(2-Ethylhexyl)phthalate	1.1 J	220	µg/L	MW-23-02	29 / 262	5-5.6	26	3.2 J - 6.8	4.8	ca	6	Federal MCL	Y	1
	105-60-2	Caprolactam	2 J	95	µg/L	MW-13-07	39 / 262	5-5.6	95	--	1,800	nc	NA	--	N	2
	86-74-8	Carbazole	--	0.54 J	µg/L	MW-06	1 / 262	5-5.6	0.54	--	NA		NA	--	N	4,5
	95-57-8	2-Chlorophenol	--	2.6 J	µg/L	MW-14D-02	1 / 261	5-5.6	2.6	--	18	nc	NA	--	N	2,4
	218-01-9	Chrysene	0.092 J	1.7	µg/L	MW-06	4 / 262	0.1-0.11	1.7	--	2.9	ca	NA	--	N	2,4
	53-70-3	Dibenzo(a,h)anthracene	0.07 J	5.5	µg/L	MW-06	31 / 260	0.1 - 5	5.5	--	0.0029	ca	NA	--	Y	1
	120-83-2	2,4-Dichlorophenol	--	5.3	µg/L	MW-14D-02	1 / 262	5-5.6	5.3	--	11	nc	NA	--	N	2,4
	84-66-2	Diethylphthalate	1.7 J	41	µg/L	MW-06	2 / 262	5-5.6	41	--	2,900	nc	NA	--	N	2,4
	131-11-3	Dimethylphthalate	--	11	µg/L	MW-06	1 / 262	5-5.6	11	--	NA		NA	--	N	4,5
	206-44-0	Fluoranthene	0.38	2.9	µg/L	MW-06	3 / 262	0.1-0.11	2.9	--	150	nc	NA	--	N	2,4
	86-73-7	Fluorene	0.033 J	0.56	µg/L	MW-14S-04	4 / 262	0.1-0.11	0.56	--	150	nc	NA	--	N	2,4
	193-39-5	Indeno(1,2,3-cd)pyrene	0.08	3.1 J	µg/L	MW-06	60 / 261	0.1 - 5	3.1	--	0.029	ca	NA	--	Y	1
	91-57-6	2-Methylnaphthalene	0.12	2.2	µg/L	MW-14S-04	6 / 262	0.1-0.11	2.2	--	15	nc	NA	--	N	2,4
	91-20-3	Naphthalene	0.03 J	14 J	µg/L	MW-14S-04	65 / 262	0.1 - 5	14	--	0.14	ca	300	NJDEP MCL	Y	1
	87-86-5	Pentachlorophenol	0.076 J	0.087 J	µg/L	ERT-6-03	2 / 200	0.2 - 10	0.09	--	0.17	ca	1	Federal MCL	N	2,4
	85-01-8	Phenanthrene	0.13	1.5	µg/L	MW-06	4 / 262	0.1-0.11	1.5	--	NA		NA	--	N	4,5
	108-95-2	Phenol	1.8 J	4.3 J	µg/L	ERT-1-08	6 / 261	5-5.6	4.3	--	1,100	nc	NA	--	N	2,4
	129-00-0	Pyrene	0.085	2.3	µg/L	MW-06	6 / 262	0.1-0.11	2.3	--	110	nc	NA	--	N	2,4
	95-94-3	1,2,4,5-Tetrachlorobenzene	--	3.5 J	µg/L	MW-14S-04	1 / 262	5-5.6	3.5	--	1.1	nc	NA	--	N	1,4
	12674-11-2	Aroclor 1016	0.064 J	30	µg/L	MW-14S-02	16 / 262	0.01 - 90	30	--	0.26	nc	0.5	Federal MCL	Y	1
	12672-29-6	Aroclor 1248	0.12 NJ	7,300 J	µg/L	MW-14S-04	21 / 257	0.01 - 90	7,300	--	0.034	ca	0.5	Federal MCL	Y	1
	11097-69-1	Aroclor 1254	0.031 J	5,600 J	µg/L	MW-14S-04	69 / 260	0.01 - 90	5,600	3.8 J - 5.4 J	0.034	ca	0.5	Federal MCL	Y	1
	319-84-6	alpha-BHC	0.09 JN	68	µg/L	MW-14S-04	13 / 262	0.05 - 26	68	--	0.011	ca	NA	--	N	1,4
	319-85-7	beta-BHC	0.06 J	680 P	µg/L	MW-14S-04	7 / 262	0.05 - 26	680	0.087 J - 0.09 J	0.037	ca	NA	--	N	1,4
	319-86-8	delta-BHC	0.18 J	880 J	µg/L	MW-14S-04	5 / 210	0.05 - 26	880	--	NA		NA	--	N	4,5
	58-89-9	gamma-BHC	0.065 P	14 JN	µg/L	MW-14S-04	6 / 262	0.05 - 26	14	--	0.061	ca	0.2	Federal MCL	N	1,4
	5103-74-2	gamma-Chlordane	0.029 J	370 J	µg/L	MW-14S-04	16 / 262	0.05 - 26	370	--	0.19	ca	0.5	NJDEP MCL	Y	1
	72-54-8	4,4'-DDD	0.09 NJ	1,800 NJ	µg/L	MW-14S-04	13 / 84	0.1 - 51	1,800	0.2 J - 0.25 J	0.28	ca	NA	--	Y	1
	72-55-9	4,4'-DDE	0.09 NJ	1,600 J	µg/L	MW-14S-04	17 / 259	0.1 - 51	1,600	--	0.20	ca	NA	--	Y	1
	50-29-3	4,4'-DDT	0.13	4,000 J	µg/L	MW-14S-04	24 / 258	0.1 - 51	4,000	0.41 - 0.53	0.20	ca	NA	--	Y	1
	60-57-1	Dieldrin	0.18 JN	350 JN	µg/L	MW-14S-04	7 / 258	0.1 - 51	350	0.22	0.0042	ca	NA	--	N	1,4
	33213-65-9	Endosulfan II	0.17 J	240 J	µg/L	MW-14S-04	7 / 262	0.1 - 51	240	--	NA		NA	--	N	4,5
	1031-07-8	Endosulfan sulfate	0.078 J	75 JN	µg/L	MW-14S-04	7 / 262	0.1 - 51	75	--	NA		NA	--	N	4,5
	72-20-8	Endrin	--	0.19 JN	µg/L	MW-05	1 / 258	0.1 - 51	0.19	--	1.1	nc	2	Federal MCL	N	2,4
	7421-93-4	Endrin aldehyde	0.11 J	150 J	µg/L	MW-14S-04	6 / 262	0.1 - 51	150	--	NA		NA	--	N	4,5
	76-44-8	Heptachlor	0.06	300	µg/L	MW-14S-04	16 / 262	0.05 - 26	300	--	0.015	ca	0.4	Federal MCL	Y	1
	1024-57-3	Heptachlor epoxide	--	2.6 NJ	µg/L	MW-12	1 / 262	0.05 - 26	2.6	--	0.0074	ca	0.2	Federal MCL	N	1,4
	72-43-5	Methoxychlor	0.03 J	400 JN	µg/L	MW-14S-04	6 / 262	0.5 - 260	400	--	18	nc	40	Federal MCL	N	1,4
	--	2,3,7,8-TCDD Toxic Equivalence (TEQ) [5]	8.1E-10 J	2.2E-01	µg/L	MW-14S-04	42 / 45	N/A	2.2E-01	1.1E-09 - 2.6E-09	5.2E-07	ca	3E-05	Federal MCL	Y	1

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - ENTIRE AQUIFER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Within and Outside the Boundaries of the Former CDE Facility - Process or Tap Water	7429-90-5	Aluminum	12.1 J	6,210	µg/L	MW-10	79 / 252	200	6,210	84.8 J - 577	3,700	nc	NA	--	Y	1
	7440-36-0	Antimony	0.32 J	3.5	µg/L	MW-07	13 / 262	2 - 4	3.5	--	1.5	nc	6	Federal MCL	N	1,4
	7440-38-2	Arsenic	0.68 J	829	µg/L	FPW-01	262 / 262	1 - 2	N/A	0.45 J - 10.9	0.045	ca	5	NJDEP MCL	Y	1
	7440-39-3	Barium	8.7 J	8,790	µg/L	ERT-2-01	261 / 262	10 - 30	8,790	76.2 - 1,780 J	730	nc	2,000	Federal MCL	Y	1
	7440-41-7	Beryllium	0.13 J	0.45 J	µg/L	MW-13-01	4 / 262	1 - 4	0.45	0.069 J	7.3	nc	4	Federal MCL	N	2,4
	7440-43-9	Cadmium	0.04 J	16.8	µg/L	MW-04	23 / 262	1 - 2	17	0.19 J	1.8	nc	5	Federal MCL	Y	1
	7440-70-2	Calcium	29,500	597,000	µg/L	ERT-2-01	262 / 262	5,000 - 10,000	N/A	40,700 - 127,000	NA		NA	--	N	3,5
	18540-29-9	Chromium	0.11 J	96.8	µg/L	MW-05	97 / 262	2 - 4	97	0.13 J - 0.75 J	0.043 [a]	ca	100	Federal MCL	Y	1
	7440-48-4	Cobalt	0.05 J	6.6	µg/L	MW-13-06	72 / 262	1 - 2	6.6	0.044 J - 0.49 J	1.1	nc	NA	--	Y	1
	7440-50-8	Copper	0.36 J	123	µg/L	MW-21-02	192 / 261	2 - 4	123	0.57 J - 3.5	150	nc	1,300	Federal MCL	N	2
	57-12-5	Cyanide	1 J	29.5	µg/L	MW-23-09	28 / 262	10	25	--	73 [b]	nc	200	Federal MCL	N	2
	7439-89-6	Iron	11 J	8,520	µg/L	MW-10	83 / 262	100-200	8,520	33.7 J - 500	2,600	nc	NA	--	Y	1
	7739-92-1	Lead	0.25 J	32.9	µg/L	MW-12	238 / 262	1 - 2	33	0.73 J - 3.7	15 [c]	al	5	NJDEP MCL	Y	1
	7439-95-4	Magnesium	1,160 J	135,000	µg/L	MW-19-06	262 / 262	5,000	N/A	9,170 - 22,300	NA		NA	--	N	3,5
	7439-96-5	Manganese	0.18 J	2,020	µg/L	MW-21-08	245 / 262	1 - 2	2,020	0.32 J - 37.8 J	88	nc	NA	--	Y	1
	7487-94-7	Mercury	0.048 J	0.12 J	µg/L	ERT-2-01; ERT-2-02	12 / 253	0.2	0.12	0.079 J - 0.12 J	0.37 [d]	nc	2	Federal MCL	N	2,4
	7440-02-0	Nickel	0.19 J	18	µg/L	FPW-02	202 / 245	1 - 2	18	0.37 J - 2.1	73 [e]	nc	NA	--	N	2
	7440-9-7	Potassium	971 J	27,800	µg/L	MW-13-01	171 / 262	5,000	27,800	971 J - 2,210 J	NA		NA	--	N	3,5
	7782-49-2	Selenium	0.16 J	2.2 J	µg/L	MW-22-02	42 / 262	5 - 10	2.2	0.3 J - 0.72 J	18	nc	50	Federal MCL	N	2
	7440-22-4	Silver	0.02 J	0.12 J	µg/L	MW-04	11 / 262	1 - 2	0.12	0.022 J	18	nc	NA	--	N	2,4
	7440-23-5	Sodium	8,450	691,000	µg/L	MW-20-01	262 / 262	5,000 - 8,000	N/A	8,980 - 15,000	NA		50,000	NJDEP MCL	N	3,5
	7440-62-2	Vanadium	1.3 J	30	µg/L	MW-12	216 / 262	5 - 10	30	1.8 J - 8.8	18	nc	NA	--	Y	1
	7440-66-6	Zinc	2.5	187	µg/L	MW-12	262 / 262	2 - 4	N/A	6.4 J - 34.7 J	1,100	nc	NA	--	N	2

Notes

[1] Detection limits are equivalent to reporting limits.

[2] Background concentrations are groundwater data from the upgradient monitoring well, ERT-8.

[3] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is for free cyanide (CN-).
c = Screening toxicity value is the drinking water action level (al) of 15 µg/L.
d = Screening toxicity value is for methylmercury.
e = Screening toxicity value is for nickel soluble salts.

[4] The potential ARAR/TBC value is the lower of the Safe Drinking Water Act Maximum Contaminant Levels (MCL) (40 CFR 141) and the New Jersey Drinking Water Quality Act MCL (NJAC 7:10-16).

[5] 2,3,7,8-TCDD Toxic Equivalence (TEQ) represents the sum of dioxin/furan TEQ and PCB congeners TEQ.

[6] Chemical was eliminated as a COPC based on low frequency of detection. Detected concentrations were not concentrated in any one area, and chemicals are not site-related contaminants of concern.

NA = Not Available
N/A = Not Applicable

Qualifier Codes:
J - indicates an estimated value
P - indicates the pesticide or Aroclor had a percent difference > 25% between the two gas chromatograph columns, and the lower of the two results is reported.
N - indicates presumptive evidence of a compound

Rationale Codes:
1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5%
5 = No screening toxicity value available

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - SHALLOW ONSITE GROUNDWATER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Onsite Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Within the Boundaries	67-64-1	Acetone	0.82 J	24	µg/L	FPW-01	5 / 33	5 - 5,000	24	--	2,200	nc	NA	--	N	2
of the	71-43-2	Benzene	0.16 J	24	µg/L	MW-11	12 / 34	0.5 - 500	24	--	0.41	ca	1	NJDEP MCL	Y	1
Former CDE Facility -	75-27-4	Bromodichloromethane	--	0.47 J	µg/L	MW-06	1 / 33	0.5 - 500	0.5	--	0.12	ca	80	Federal MCL	N [6]	1,4
Top of the Groundwater	75-25-2	Bromoform	0.62	2.9	µg/L	MW-03	3 / 34	0.5 - 500	2.9	--	8.5	ca	80	Federal MCL	N	2
Table	78-93-3	2-Butanone	--	5.5	µg/L	FPW-01	1 / 31	5 - 5,000	5.5	--	710	nc	NA	--	N	2,4
	108-90-7	Chlorobenzene	0.21 J	65	µg/L	MW-09	16 / 34	0.5 - 500	65	--	9.1	nc	50	NJDEP MCL	Y	1
	67-66-3	Chloroform	0.37 J	19	µg/L	MW-11	10 / 34	0.5 - 500	19	--	0.19	ca	80	NJDEP MCL	Y	1
	110-82-7	Cyclohexane	0.25 J	13	µg/L	MW-11	7 / 34	0.5 - 500	13	--	1,300	nc	NA	--	N	2
	96-12-8	1,2-Dibromo-3-chloropropane	0.039 J	0.39 J	µg/L	MW-11	7 / 34	0.05	0.39	--	0.00032	ca	0.2	Federal MCL	Y	1
	124-48-1	Dibromochloromethane	0.43 J	1.2	µg/L	MW-03	2 / 34	0.5 - 500	1.2	--	0.15	ca	80	Federal MCL	Y	1
	106-93-4	1,2-Dibromoethane	--	0.01 J	µg/L	MW-03	1 / 34	0.05 - 500	0.01	--	0.0065	ca	0.05	Federal MCL	N	1,4
	95-50-1	1,2-Dichlorobenzene	0.2 J	56	µg/L	MW-12	13 / 34	0.5 - 500	56	--	37	nc	600	Federal MCL	Y	1
	541-73-1	1,3-Dichlorobenzene	0.24 J	120	µg/L	MW-12	14 / 34	0.5 - 500	120	--	NA		600	NJDEP MCL	Y	5
	106-46-7	1,4-Dichlorobenzene	0.43 J	110	µg/L	MW-12	14 / 34	0.5 - 500	110	--	0.43	ca	75	Federal MCL	Y	1
	75-34-3	1,1-Dichloroethane	0.55	11	µg/L	FPW-01	5 / 34	0.5 - 500	11	--	2.4	ca	50	NJDEP MCL	Y	1
	107-06-2	1,2-Dichloroethane	0.22 J	15	µg/L	MW-11	5 / 34	0.5 - 500	15	--	0.15	ca	2	NJDEP MCL	Y	1
	75-35-4	1,1-Dichloroethene	0.73	280 J	µg/L	MW-11	13 / 34	0.5 - 500	280	--	34	nc	2	NJDEP MCL	Y	1
	156-59-2	cis-1,2-Dichloroethene	0.96 J	390,000 J	µg/L	MW-11	32 / 34	0.5 - 500	390,000	--	7.3	nc	70	Federal MCL	Y	1
	156-60-5	trans-1,2-Dichloroethene	0.11 J	1,300 J	µg/L	MW-11	23 / 34	0.5 - 500	1,300	--	11	nc	100	Federal MCL	Y	1
	100-41-4	Ethylbenzene	0.62	20	µg/L	MW-11	2 / 34	0.5 - 500	20	--	1.5	ca	700	Federal MCL	Y	1
	98-82-8	Isopropylbenzene	0.2 J	5.1 J	µg/L	MW-11	2 / 34	0.5 - 500	5.1	--	68	nc	NA	--	N	2
	1634-04-4	Methyl tert-butyl ether	0.15 J	1.3	µg/L	MW-05	7 / 34	0.5 - 500	1.3	--	12	ca	70	NJDEP MCL	N	2
	108-87-2	Methylcyclohexane	0.89	42	µg/L	MW-11	6 / 33	0.5 - 500	42	--	NA		NA	--	Y	5
	75-09-2	Methylene chloride	0.36 J	7 J	µg/L	MW-11	4 / 34	0.5 - 500	7.0	--	4.8	ca	3	NJDEP MCL	Y	1
	127-18-4	Tetrachloroethene	0.25 J	1,600	µg/L	MW-06	21 / 34	0.5 - 500	1,600	--	0.11	ca	1	NJDEP MCL	Y	1
	108-88-3	Toluene	0.13 J	52	µg/L	MW-16-01	11 / 34	0.5 - 500	52	--	230	nc	1,000	Federal MCL	N	2
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.2	2.2	µg/L	MW-01A	2 / 34	0.5 - 500	2.2	--	5,900	nc	NA	--	N	2
	87-61-6	1,2,3-Trichlorobenzene	0.58 J	280	µg/L	MW-12	16 / 34	0.5 - 500	280	--	2.9	nc	NA	--	Y	1
	120-82-1	1,2,4-Trichlorobenzene	0.4 J	1,600 J	µg/L	MW-12	21 / 34	0.5 - 500	1,600	--	0.41	nc	9	NJDEP MCL	Y	1
	71-55-6	1,1,1-Trichloroethane	--	0.32 J	µg/L	MW-01A	1 / 34	0.5 - 500	0.32	--	910	nc	30	NJDEP MCL	N	2,4
	79-00-5	1,1,2-Trichloroethane	0.49 J	120	µg/L	MW-11	10 / 34	0.5 - 500	120	--	0.24	ca	3	NJDEP MCL	Y	1
	79-01-6	Trichloroethene	0.53	170,000	µg/L	MW-11	34 / 34	N/A	170,000	--	2.0	ca	1	NJDEP MCL	Y	1
	1330-20-7	m,p-Xylene	0.57	12 J	µg/L	MW-11	2 / 34	0.5 - 500	12	--	20	nc	1,000	NJDEP MCL	N	2
	1330-20-7	o-Xylene	1.4	85	µg/L	MW-11	3 / 34	0.5 - 500	85	--	20	nc	1,000	NJDEP MCL	Y	1
	75-01-4	Vinyl chloride	0.5 J	860 J	µg/L	MW-11	22 / 34	0.5 - 500	860	--	0.016	ca	2	Federal MCL	Y	1
	83-32-9	Acenaphthene	0.26	0.39	µg/L	MW-02A	3 / 34	0.1	0.39	--	220	nc	NA	--	N	2
	120-12-7	Anthracene	--	0.49 J	µg/L	MW-06	1 / 34	0.1 - 5	0.49	--	1,100	nc	NA	--	N	2,4
	100-52-7	Benzaldehyde	--	7.2	µg/L	MW-14S-01	1 / 34	5	7.2	--	370	nc	NA	--	N	2,4
	56-55-3	Benzo(a)anthracene	0.18	1.7	µg/L	MW-06	2 / 34	0.1	1.7	--	0.029	ca	NA	--	Y	1
	50-32-8	Benzo(a)pyrene	0.14	2.5 J	µg/L	MW-06	3 / 34	0.1 - 5	2.5	--	0.0029	ca	2	Federal MCL	Y	1
	205-99-2	Benzo(b)fluoranthene	0.38	2.1 J	µg/L	MW-06	2 / 34	0.1 - 5	2.1	--	0.029	ca	NA	--	Y	1
	191-24-2	Benzo(g,h,i)perylene	0.17	2.4 J	µg/L	MW-06	3 / 34	0.1 - 5	2.4	--	NA		NA	--	Y	5
	207-08-9	Benzo(k)fluoranthene	0.21	2 J	µg/L	MW-06	2 / 34	0.1 - 5	2.0	--	0.29	ca	NA	--	Y	1
	92-52-4	1,1'-Biphenyl	1.1 J	2.3 J	µg/L	MW-11	2 / 34	5	2.3	--	0.083	nc	NA	--	Y	1
	117-81-7	bis(2-Ethylhexyl)phthalate	3.7 J	4.4 J	µg/L	ERT-1-01	2 / 34	5	4.4	--	4.8	ca	6	Federal MCL	N	2
	105-60-2	Caprolactam	2.3 J	6.5	µg/L	MW-16-01	2 / 34	5	6.5	--	1,800	nc	NA	--	N	2
	86-74-8	Carbazole	--	0.54 J	µg/L	MW-06	1 / 34	5	0.54	--	NA		NA	--	N	4,5
	218-01-9	Chrysene	0.21	1.7	µg/L	MW-06	2 / 34	0.1	1.7	--	2.9	ca	NA	--	N	2
	53-70-3	Dibenzo(a,h)anthracene	0.096 J	5.5	µg/L	MW-06	5 / 34	0.1	5.5	--	0.0029	ca	NA	--	Y	1
	84-66-2	Diethylphthalate	--	41	µg/L	MW-06	1 / 34	5	41	--	2,900	nc	NA	--	N	2,4
	131-11-3	Dimethylphthalate	--	11	µg/L	MW-06	1 / 34	5	11	--	NA		NA	--	N	4,5
	206-44-0	Fluoranthene	0.38	2.9	µg/L	MW-06	2 / 34	0.1	2.9	--	150	nc	NA	--	N	2
	86-73-7	Fluorene	--	0.29	µg/L	MW-06	1 / 34	0.1	0.29	--	150	nc	NA	--	N	2,4
	193-39-5	Indeno(1,2,3-cd)pyrene	0.11	3.1 J	µg/L	MW-06	6 / 34	0.1 - 5	3.1	--	0.029	ca	NA	--	Y	1
	91-57-6	2-Methylnaphthalene	0.16	0.27	µg/L	MW-11	3 / 34	0.1	0.27	--	15	nc	NA	--	N	2
	91-20-3	Naphthalene	0.08	6.5	µg/L	MW-11	12 / 34	0.1 - 5	6.5	--	0.14	ca	300	NJDEP MCL	Y	1
	87-86-5	Pentachlorophenol	--	0.076 J	µg/L	MW-06	1 / 24	0.2 - 10	0.08	--	0.17	ca	1	Federal MCL	N	2,4
	85-01-8	Phenanthrene	0.13	1.5	µg/L	MW-06	2 / 34	0.1	1.5	--	NA		NA	--	Y	5
	129-00-0	Pyrene	0.33	2.3	µg/L	MW-06	2 / 34	0.1	2.3	--	110	nc	NA	--	N	2
	12674-11-2	Aroclor 1016	0.28	14	µg/L	MW-14S-01	4 / 34	0.05 - 5	14	--	0.26	nc	0.5	Federal MCL	Y	1

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - SHALLOW ONSITE GROUNDWATER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Onsite Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Within the Boundaries	12672-29-6	Aroclor 1248	1.4	40 J	µg/L	MW-14S-01	6 / 32	0.05 - 5	40	--	0.034	ca	0.5	Federal MCL	Y	1
of the	11097-69-1	Aroclor 1254	0.045 J	190 J	µg/L	MW-11	20 / 34	0.05 - 5	190	--	0.034	ca	0.5	Federal MCL	Y	1
Former CDE Facility -	319-84-6	alpha-BHC	0.14	2.7	µg/L	MW-11	9 / 34	0.05 - 5	2.7	--	0.011	ca	NA	--	Y	1
Top of the Groundwater	319-85-7	beta-BHC	--	0.97 J	µg/L	MW-14S-01	1 / 34	0.05 - 5	1.0	--	0.037	ca	NA	--	N	1,4
Table	319-86-8	delta-BHC	0.34 J	3.6 J	µg/L	MW-12	2 / 31	0.05 - 5	3.6	--	NA	ca	NA	--	Y	5
	58-89-9	gamma-BHC	0.065 P	1.3 J	µg/L	MW-12	4 / 34	0.05 - 5	1.3	--	0.061	ca	0.2	Federal MCL	Y	1
	5103-74-2	gamma-Chlordane	0.072	21 J	µg/L	MW-11	7 / 34	0.05 - 5	21	--	0.19	ca	0.5	NJDEP MCL	Y	1
	72-54-8	4,4'-DDD	0.09	2.2 JN	µg/L	MW-14S-01	6 / 15	0.1 - 0.11	2.2	--	0.28	ca	NA	--	Y	1
	72-55-9	4,4'-DDE	0.09	9.8	µg/L	MW-11	8 / 31	0.1 - 1	9.8	--	0.20	ca	NA	--	Y	1
	50-29-3	4,4'-DDT	0.13	36 JN	µg/L	MW-11	9 / 30	0.1 - 1	36	--	0.20	ca	NA	--	Y	1
	60-57-1	Dieldrin	0.19 J	3.1 JN	µg/L	MW-09	4 / 31	0.1 - 0.5	3.1	--	0.0042	ca	NA	--	Y	1
	33213-65-9	Endosulfan II	0.17 J	8.5	µg/L	MW-11	5 / 34	0.1 - 1	8.5	--	NA		NA	--	Y	5
	1031-07-8	Endosulfan sulfate	0.078 J	3.1 NJ	µg/L	MW-11	5 / 34	0.1 - 1	3.1	--	NA		NA	--	Y	5
	72-20-8	Endrin	--	0.19 JN	µg/L	MW-05	1 / 32	0.1 - 1	0.19	--	1.1	nc	2	Federal MCL	N	2,4
	7421-93-4	Endrin aldehyde	0.11 J	5.7	µg/L	MW-11	4 / 34	0.1 - 1	5.7	--	NA		NA	--	Y	5
	76-44-8	Heptachlor	0.06	5.1	µg/L	MW-12	9 / 34	0.05 - 5	5.1	--	0.015	ca	0.4	Federal MCL	Y	1
	1024-57-3	Heptachlor epoxide	--	2.6 NJ	µg/L	MW-12	1 / 34	0.05 - 5	2.6	--	0.0074	ca	0.2	Federal MCL	N	1,4
	72-43-5	Methoxychlor	0.97 JN	11	µg/L	MW-09	2 / 34	0.5 - 5	11	--	18	nc	40	Federal MCL	N	2
	--	2,3,7,8-TCDD Toxic Equivalence (TEQ) [5]	8.1E-10 J	8.4E-04	µg/L	MW-11	13 / 13	N/A	8.4E-04	NA	5.2E-07	ca	3E-05	Federal MCL	Y	1
	7429-90-5	Aluminum	71.3 J	6,210	µg/L	MW-10	26 / 34	200	6,210	125 J - 577	3,700	nc	NA	--	Y	1
	7440-36-0	Antimony	--	3.5	µg/L	MW-07	1 / 34	2	3.5	--	1.5	nc	6	Federal MCL	N	1,4
	7440-38-2	Arsenic	0.68 J	829	µg/L	FPW-01	34 / 34	N/A	829	0.7 J - 1.1	0.045	ca	5	NJDEP MCL	Y	1
	7440-39-3	Barium	70.6	2,650	µg/L	MW-11	34 / 34	N/A	2,650	899 - 1,250	730	nc	2,000	Federal MCL	Y	1
	7440-41-7	Beryllium	0.2 J	0.23 J	µg/L	MW-12	2 / 34	1	0.23	0.069 J	7.3	nc	4	Federal MCL	N	2
	7440-43-9	Cadmium	1	16.8	µg/L	MW-04	5 / 34	1	17	--	1.8	nc	5	Federal MCL	Y	1
	7440-70-2	Calcium	41,200	142,000	µg/L	MW-11	34 / 34	N/A	142,000	109,000	NA		NA	--	N	3,5
	18540-29-9	Chromium	0.34 J	96.8	µg/L	MW-05	21 / 34	2	97	0.68 J - 0.69 J	0.043 [a]	ca	100	Federal MCL	Y	1
	7440-48-4	Cobalt	0.17 J	3.5	µg/L	MW-06	14 / 34	1	3.5	--	1.1	nc	NA	--	Y	1
	7440-50-8	Copper	0.57 J	80.1	µg/L	MW-09	29 / 34	2	80	0.78 J - 2.1 J	150	nc	1,300	Federal MCL	N	2
	57-12-5	Cyanide	1.1 J	11.6 J	µg/L	MW-11	4 / 34	10	12	--	73 [b]	nc	200	Federal MCL	N	2
	7439-89-6	Iron	46.6 J	8,520	µg/L	MW-10	31 / 34	100	8,520	500	2,600	nc	NA	--	Y	1
	7739-92-1	Lead	0.25 J	33	µg/L	MW-12	22 / 34	1	33	1.4 - 2	15 [c]	al	5	NJDEP MCL	Y	1
	7439-95-4	Magnesium	6,960	24,300	µg/L	MW-09	34 / 34	N/A	24,300	9,170 - 9,620	NA		NA	--	N	3,5
	7439-96-5	Manganese	23.4	1,660	µg/L	MW-11	34 / 34	N/A	1,660	7.7 - 37.8 J	88	nc	NA	--	Y	1
	7487-94-7	Mercury	0.048 J	0.11 J	µg/L	MW-04	3 / 34	0.2	0.11	0.12 J	0.37 [d]	nc	2	Federal MCL	N	2
	7440-02-0	Nickel	0.32 J	13.5	µg/L	MW-05	32 / 32	1	14	--	73 [e]	nc	NA	--	N	2
	7440-9-7	Potassium	1,390 J	9,450	µg/L	MW-07	24 / 34	5,000	9,450	1,430 J	NA		NA	--	N	3,5
	7782-49-2	Selenium	0.19 J	0.37 J	µg/L	ERT-1-01	2 / 34	5	0.37	0.3 J	18	nc	50	Federal MCL	N	2
	7440-22-4	Silver	0.02 J	0.11 J	µg/L	MW-04	7 / 34	1	0.11	--	18	nc	NA	--	N	2
	7440-23-5	Sodium	10,900	59,800	µg/L	MW-02A	34 / 34	N/A	59,800	14,400 - 15,000	NA		50,000	NJDEP MCL	N	3,5
	7440-62-2	Vanadium	1.3 J	30	µg/L	MW-12	21 / 34	5	30	3.4 J	18	nc	NA	--	Y	1
	7440-66-6	Zinc	2.5	187	µg/L	MW-12	34 / 34	N/A	187	8.6 J - 15.4 J	1,100	nc	NA	--	N	2

Notes

[1] Detection limits are equivalent to reporting limits.

[2] Background concentrations are groundwater data from the upgradient monitoring well, ERT-8

[3] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

- a = Screening toxicity value is for Chromium VI.
- b = Screening toxicity value is for free cyanide (CN-).
- c = Screening toxicity value is the drinking water action level (al) of 15 µg/L.
- d = Screening toxicity value is for methylmercury.
- e = Screening toxicity value is for nickel soluble salts.

[4] The potential ARAR/TBC value is the lower of the Safe Drinking Water Act Maximum Contaminant Levels (MCL) (40 CFR 141) and the New Jersey Drinking Water Quality Act MCL (NJAC 7:10-16).

[5] 2,3,7,8-TCDD Toxic Equivalence (TEQ) represents the sum of dioxin/furan TEQ and PCB congeners TEQ.

[6] Chemical was eliminated as a COPC based on low frequency of detection. Detected concentrations were not concentrated in any one area, and chemicals are not site-related contaminants of concern.

NA = Not Available

N/A = Not Applicable

Qualifier Codes:

J - indicates an estimated value

P - indicates the pesticide or Aroclor had a percent difference > 25% between the two gas chromatograph columns, and the lower of the two results is reported.

N - indicates presumptive evidence of a compound

Rationale Codes:

1 = Maximum concentration exceeds screening toxicity value

2 = Maximum concentration does not exceed screening toxicity value

3 = Chemical is an essential nutrient

4 = Frequency of detection is less than 5%

5 = No screening toxicity value available

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - SHALLOW OFFSITE GROUNDWATER, SOUTH OF BOUND BROOK
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Offsite, South Bound Brook Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Outside the Boundaries of the Former CDE Facility - Top of the Groundwater Table	71-43-2	Benzene	--	0.5	µg/L	ERT-2-01	1 / 8	0.5 - 10	1	--	0.41	ca	1	NJDEP MCL	Y	1
	75-25-2	Bromoform	0.59	1.8	µg/L	ERT-5-01	2 / 8	0.5 - 10	1.8	--	8.5	ca	80	Federal MCL	N	2
	67-66-3	Chloroform	--	1.1	µg/L	ERT-7-01	1 / 8	0.5 - 10	1	--	0.19	ca	80	Federal MCL	Y	1
	124-48-1	Dibromochloromethane	--	0.51	µg/L	ERT-5-01	1 / 8	0.5 - 10	0.5	--	0.15	ca	80	Federal MCL	Y	1
	156-59-2	cis-1,2-Dichloroethene	0.36 J	31	µg/L	ERT-2-01	4 / 8	0.5 - 10	31	--	7.3	nc	70	Federal MCL	Y	1
	1634-04-4	Methyl tert-butyl ether	0.54	330	µg/L	ERT-2-01	4 / 8	0.5 - 10	330	--	12	ca	70	NJDEP MCL	Y	1
	127-18-4	Tetrachloroethene	--	1.9	µg/L	ERT-2-01	1 / 8	0.5 - 10	2	--	0.11	ca	1	NJDEP MCL	Y	1
	108-88-3	Toluene	0.32 J	0.52	µg/L	ERT-7-01	3 / 8	0.5 - 10	1	--	230	nc	1,000	Federal MCL	N	2
	79-01-6	Trichloroethene	620	1,800	µg/L	ERT-2-01	2 / 8	0.5 - 10	1,800	--	2.0	ca	1	NJDEP MCL	Y	1
	117-81-7	bis(2-Ethylhexyl)phthalate	1.2 J	2.5 J	µg/L	ERT-2-01	2 / 8	5	3	--	4.8	ca	6	Federal MCL	N	2
	105-60-2	Caprolactam	--	2.3 J	µg/L	ERT-6-01	1 / 8	5	2	--	1,800	nc	NA	--	N	2
	53-70-3	Dibenzo(a,h)anthracene	--	2.4 J	µg/L	ERT-7-01	1 / 8	0.1 - 5	2.4	--	0.0029	ca	NA	--	Y	1
	193-39-5	Indeno(1,2,3-cd)pyrene	--	0.11 J	µg/L	ERT-5-01	1 / 8	0.1	0.1	--	0.029	ca	NA	--	Y	1
	91-20-3	Naphthalene	0.084 J	0.18	µg/L	ERT-7-01	2 / 8	0.1	0	--	0.14	ca	300	NJDEP MCL	Y	1
	12672-29-6	Aroclor 1248	--	2 JN	µg/L	ERT-2-01	1 / 8	0.05 - 0.09	2	--	0.034	ca	0.5	Federal MCL	Y	1
	11097-69-1	Aroclor 1254	--	3.1 J	µg/L	ERT-2-01	1 / 8	0.05 - 0.09	3	--	0.034	ca	0.5	Federal MCL	Y	1
	--	2,3,7,8-TCDD Toxic Equivalence (TEQ) [5]	1.5E-07	1.7E-06	µg/L	ERT-2-01	2 / 2	N/A	1.7E-06	NA	5.2E-07	ca	3E-05	Federal MCL	Y	1
	7429-90-5	Aluminum	100 J	369	µg/L	ERT-2-01	4 / 8	200	369	125 J - 577	3,700	nc	NA	--	N	2
	7440-38-2	Arsenic	0.85 J	68.8	µg/L	ERT-7-01	8 / 8	N/A	69	0.7 J - 1.1	0.045	ca	5	NJDEP MCL	Y	1
	7440-39-3	Barium	158	8,790	µg/L	ERT-2-01	8 / 8	N/A	8,790	899 - 1,250	730	nc	2,000	Federal MCL	Y	1
	7440-70-2	Calcium	49,250	597,000	µg/L	ERT-2-01	8 / 8	N/A	597,000	109,000	NA		NA	--	N	3,5
	18540-29-9	Chromium	0.45 J	0.57 J	µg/L	ERT-6-01	2 / 8	2 - 4	1	0.68 J - 0.69 J	0.043 [a]	ca	100	Federal MCL	Y	1
	7440-48-4	Cobalt	0.25 J	0.41 J	µg/L	ERT-2-01	2 / 8	1 - 2	0.4	--	1.1	nc	NA	--	N	2
	7440-50-8	Copper	0.72 J	2.8	µg/L	ERT-7-01	2 / 8	2 - 4	3	0.78 J - 2.1 J	150	nc	1,300	Federal MCL	N	2
	7439-89-6	Iron	86.9 J	1,870	µg/L	ERT-6-01	6 / 8	100	1,870	500	2,600	nc	NA	--	N	2
	7739-92-1	Lead	0.26 J	2.8	µg/L	ERT-7-01	5 / 8	1 - 2	3	1.4 - 2	15 [b]	al	5	NJDEP MCL	N	2
	7439-95-4	Magnesium	5,130	48,900	µg/L	ERT-2-01	8 / 8	N/A	48,900	9,170 - 9,620	NA		NA	--	N	3,5
	7439-96-5	Manganese	34.9	484	µg/L	ERT-6-01	8 / 8	N/A	484	7.7 - 37.8 J	88	nc	NA	--	Y	1
	7487-94-7	Mercury	--	0.12 J	µg/L	ERT-2-01	1 / 8	0.2	0.12	0.12 J	0.37 [c]	nc	2	Federal MCL	N	2
	7440-02-0	Nickel	0.85 J	11 J	µg/L	ERT-2-01	5 / 8	1 - 2	11	--	73 [d]	nc	NA	--	N	2
	7440-9-7	Potassium	1,340 J	5,740 J	µg/L	ERT-2-01	5 / 8	5,000	5,740	1,430 J	NA		NA	--	N	3,5
	7782-49-2	Selenium	--	0.97 J	µg/L	ERT-2-01	1 / 8	5 - 10	1.0	0.3 J	18	nc	50	Federal MCL	N	2
	7440-23-5	Sodium	10,000	47,000	µg/L	ERT-2-01	8 / 8	N/A	47,000	14,400 - 15,000	NA		50,000	NJDEP MCL	N	3,5
	7440-62-2	Vanadium	1.4 J	3.4 J	µg/L	ERT-6-01	4 / 8	5 - 10	3	3.4 J	18	nc	NA	--	N	2
	7440-66-6	Zinc	5 J	20.1	µg/L	ERT-7-01	8 / 8	N/A	20	8.6 J - 15.4 J	1,100	nc	NA	--	N	2

Notes

[1] Detection limits are equivalent to reporting limits

[2] Background concentrations are groundwater data from the upgradient monitoring well, ERT-8

[3] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is the drinking water action level (al) of 15 µg/L.
c = Screening toxicity value is for methylmercury.
d = Screening toxicity value is for nickel soluble salts.

[4] The potential ARAR/TBC value is the lower of the Safe Drinking Water Act Maximum Contaminant Levels (MCL) (40 CFR 141) and the New Jersey Drinking Water Quality Act MCL (NJAC 7:10-16).

[5] 2,3,7,8-TCDD Toxic Equivalence (TEQ) represents the sum of dioxin/furan TEQ and PCB congeners TEQ

NA = Not Available

Qualifier Codes:
J - indicates an estimated value
N - indicates presumptive evidence of a compound

Rationale Codes:
1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5%
5 = No screening toxicity value available

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - SHALLOW OFFSITE GROUNDWATER, NORTH OF BOUND BROOK
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Offsite, North Bound Brook Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits [1]	Concentration Used for Screening	Background Value [2]	Screening Toxicity Value [3]	Basis	Potential ARAR/TBC Value [4]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Outside the Boundaries of the Former CDE Facility - Top of the Groundwater Table	67-64-1	Acetone	2.3 J	230	µg/L	MW-20-01	9 / 16	5 - 25	230	--	2,200	nc	NA	--	N	2
	71-43-2	Benzene	0.21 J	1.8	µg/L	MW-20-01	2 / 16	0.5 - 2.5	1.8	--	0.41	ca	1	NJDEP MCL	Y	1
	75-27-4	Bromodichloromethane	0.25 J	0.7	µg/L	MW-19-01	2 / 16	0.5 - 2.5	0.7	--	0.12	ca	80	Federal MCL	Y	1
	67-66-3	Chloroform	0.68	3	µg/L	MW-13-01	5 / 16	0.5 - 2.5	3	--	0.19	ca	80	Federal MCL	Y	1
	75-34-3	1,1-Dichloroethane	0.16 J	0.28 J	µg/L	MW-13-01	2 / 16	0.5 - 2.5	0.28	--	2.4	ca	50	NJDEP MCL	N	2
	75-35-4	1,1-Dichloroethene	0.53	2.2	µg/L	MW-19-01	4 / 16	0.5 - 2.5	2.2	--	34	nc	2	NJDEP MCL	N	2
	156-59-2	cis-1,2-Dichloroethene	0.32 J	110	µg/L	MW-20-01	12 / 16	0.5 - 2.5	110	--	7.3	nc	70	Federal MCL	Y	1
	1634-04-4	Methyl tert-butyl ether	0.1 J	4.4 J	µg/L	MW-20-01	7 / 16	0.5 - 2.5	4.4	--	12	ca	70	NJDEP MCL	N	2
	75-09-2	Methylene chloride	0.28 J	3.3 J	µg/L	MW-13-01	2 / 16	0.5 - 2.5	3.3	--	4.8	ca	3	NJDEP MCL	N	2
	127-18-4	Tetrachloroethene	0.19 J	0.81	µg/L	ERT-4-01	3 / 16	0.5 - 2.5	0.81	--	0.11	ca	1	NJDEP MCL	Y	1
	108-88-3	Toluene	0.25 J	27	µg/L	MW-13-01	9 / 16	0.5 - 2.5	27	0.66 - 33E	230	nc	1,000	Federal MCL	N	2
	71-55-6	1,1,1-Trichloroethane	0.27 J	0.41 J	µg/L	MW-19-01	2 / 16	0.5 - 2.5	0.4	--	910	nc	30	NJDEP MCL	N	2
	79-01-6	Trichloroethene	0.43 J	310	µg/L	ERT-4-01	14 / 16	0.5 - 2.5	310	0.29 J - 0.54	2.0	ca	1	NJDEP MCL	Y	1
	75-01-4	Vinyl chloride	--	0.36 J	µg/L	MW-13-01	1 / 16	0.5 - 2.5	0.36	--	0.016	ca	2	Federal MCL	Y	1
	191-24-2	Benzo(g,h,i)perylene	--	0.098 J	µg/L	MW-19-01	1 / 16	0.1	0.098	--	NA		NA	--	Y	5
	117-81-7	bis(2-Ethylhexyl)phthalate	--	5.2	µg/L	ERT-4-01	1 / 16	5	5.2	3.2 J - 6.8	4.8	ca	6	Federal MCL	Y	1
	105-60-2	Caprolactam	2.5 J	30	µg/L	MW-23-01	3 / 16	5	30	--	1,800	nc	NA	--	N	2
	193-39-5	Indeno(1,2,3-cd)pyrene	0.11 J	0.15	µg/L	MW-20-01	3 / 16	0.1	0.15	--	0.029	ca	NA	--	Y	1
	91-20-3	Naphthalene	0.1	0.16	µg/L	MW-13-01	2 / 16	0.1	0.16	--	0.14	ca	300	NJDEP MCL	Y	1
	12672-29-6	Aroclor 1248	0.45 J	1.2	µg/L	MW-20-01	2 / 16	0.01 - 0.1	1.2	--	0.034	ca	0.5	Federal MCL	Y	1
	11097-69-1	Aroclor 1254	0.038 J	1 J	µg/L	MW-20-01	2 / 15	0.01 - 0.1	1	3.8 J - 5.4 J	0.034	ca	0.5	Federal MCL	Y	1
	319-85-7	beta-BHC	--	0.35	µg/L	MW-20-01	1 / 16	0.05 - 0.056	0.35	0.087 J - 0.09 J	0.037	ca	NA	--	Y	1
	319-86-8	delta-BHC	--	0.42	µg/L	MW-20-01	1 / 14	0.05 - 0.056	0.42	--	NA	ca	NA	--	Y	5
	72-54-8	4,4'-DDD	0.11 JN	0.76 NJ	µg/L	MW-20-01	2 / 6	0.1 - 0.11	0.76	0.2 J - 0.25 J	0.28	ca	NA	--	Y	1
	72-55-9	4,4'-DDE	--	0.75 J	µg/L	MW-20-01	1 / 16	0.1 - 0.11	0.75	--	0.20	ca	NA	--	Y	1
	50-29-3	4,4'-DDT	0.16	1.5 J	µg/L	MW-20-01	2 / 16	0.1 - 0.11	1.5	0.41 - 0.53	0.20	ca	NA	--	Y	1
	5103-74-2	gamma-Chlordane	--	0.03 J	µg/L	MW-23-01	1 / 16	0.05 - 0.056	0.03	--	0.19	ca	0.5	NJDEP MCL	N	2
	76-44-8	Heptachlor	--	0.2	µg/L	MW-20-01	1 / 16	0.05 - 0.056	0.2	--	0.015	ca	0.4	Federal MCL	Y	1
	--	2,3,7,8-TCDD Toxic Equivalence (TEQ) [5]	--	4.0E-08	µg/L	MW22-01	1 / 2	N/A	4.0E-08	NA	5.2E-07	ca	3E-05	Federal MCL	N	2
	7429-90-5	Aluminum	28.3 J	1,820	µg/L	MW-13-01	5 / 15	200	1,820	84.8 J - 577	3,700	nc	NA	--	N	2
	7440-36-0	Antimony	0.51 J	2.2	µg/L	MW-13-01	2 / 16	2	2.2	--	1.5	nc	6	Federal MCL	Y	1
	7440-38-2	Arsenic	0.75 J	180	µg/L	MW-20-01	16 / 16	N/A	180	0.45 J - 10.9	0.045	ca	5	NJDEP MCL	Y	1
	7440-39-3	Barium	24.3	556	µg/L	MW-20-01	16 / 16	N/A	556	76.2 - 1,780 J	730	nc	2,000	Federal MCL	N	2
	7440-41-7	Beryllium	--	0.45 J	µg/L	MW-13-01	1 / 16	1	0.45	0.069 J	7.3	nc	4	Federal MCL	N	2
	7440-43-9	Cadmium	0.04 J	0.3 J	µg/L	MW-13-01	5 / 16	1	0.3	0.19 J	1.8	nc	5	Federal MCL	N	2
	7440-70-2	Calcium	29,500	194,000	µg/L	ERT-3-01	16 / 16	N/A	194,000	40,700 - 127,000	NA		NA	--	N	3,5
	18540-29-9	Chromium	0.11 J	3.5	µg/L	MW-13-01	7 / 16	2	3.5	0.13 J - 0.75 J	0.043 [a]	ca	100	Federal MCL	Y	1
	7440-48-4	Cobalt	0.13 J	1.4	µg/L	MW-13-01	6 / 16	1	1.4	0.044 J - 0.49 J	1.1	nc	NA	--	Y	1
	7440-50-8	Copper	0.58 J	69.9	µg/L	MW-21-01	14 / 16	2	70	0.57 J - 3.5	150	nc	1,300	Federal MCL	N	2
	57-12-5	Cyanide	1 J	19.9	µg/L	MW-23-01	4 / 16	10	3.8	--	73 [b]	nc	200	Federal MCL	N	2
	7439-89-6	Iron	14.8 J	1,220	µg/L	MW-13-01	11 / 16	100	1,220	33.7 J - 500	2,600	nc	NA	--	N	2
	7739-92-1	Lead	0.42 J	20.9	µg/L	MW-21-01	15 / 16	1	21	0.73 J - 3.7	15 [c]	al	5	NJDEP MCL	Y	1
	7439-95-4	Magnesium	1,160 J	46,100	µg/L	MW-19-01	16 / 16	N/A	46,100	9,170 - 22,300	NA		NA	--	N	3,5
	7439-96-5	Manganese	1.2	1,580 J	µg/L	MW-20-01	16 / 16	N/A	1,580	0.32 J - 37.8 J	88	nc	NA	--	Y	1
	7440-02-0	Nickel	0.35 J	5 J	µg/L	MW-20-01	14 / 16	1	5.0	0.37 J - 2.1	73 [d]	nc	NA	--	N	2
	7440-9-7	Potassium	1,390 J	27,800	µg/L	MW-13-01	16 / 16	N/A	27,800	971 J - 2,210 J	NA		NA	--	N	3,5
	7782-49-2	Selenium	0.68 J	1.7 J	µg/L	ERT-4-01	4 / 16	5	1.7	0.3 J - 0.72 J	18	nc	50	Federal MCL	N	2
	7440-23-5	Sodium	10,300	691,000	µg/L	MW-20-01	16 / 16	N/A	691,000	8,980 - 15,000	NA		50,000	NJDEP MCL	N	3,5
	7440-62-2	Vanadium	1.4 J	20.5	µg/L	MW-13-01	13 / 16	5	20.5	1.8 J - 8.8	18	nc	NA	--	Y	1
	7440-66-6	Zinc	5.2	74.3	µg/L	MW-21-01	16 / 16	N/A	74.3	6.4 J - 34.7 J	1,100	nc	NA	--	N	2

Notes

[1] Detection limits are equivalent to reporting limits.

[2] Background concentrations are groundwater data from the upgradient monitoring well, ERT-8

[3] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is for free cyanide (CN-).
c = Screening toxicity value is the drinking water action level (al) of 15 µg/L.
d = Screening toxicity value is for nickel soluble salts.

[4] The potential ARAR/TBC value is the lower of the Safe Drinking Water Act Maximum Contaminant Levels (MCL) (40 CFR 141) and the New Jersey Drinking Water Quality Act MCL (NJAC 7:10-16).

[5] 2,3,7,8-TCDD Toxic Equivalence (TEQ) represents the sum of dioxin/furan TEQ and PCB congeners TEQ.

NA = Not Available

Qualifier Codes:
J - indicates an estimated value
N - indicates presumptive evidence of a compound

Rationale Codes:
1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5%
5 = No screening toxicity value available

TABLE 3.1
EXPOSURE POINT CONCENTRATION SUMMARY - ENTIRE AQUIFER
REASONABLE MAXIMUM EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL Concentration [2] (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Within and Outside the Boundaries of the Former CDE Facility - Process or Tap Water	Benzene	µg/L	1.8	0.72 (NP)	24	0.72	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Bromodichloromethane	µg/L	0.54	0.41 (NP)	1.7	0.41	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Chlorobenzene	µg/L	11	3.7 (NP)	65	3.7	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Chloroform	µg/L	3.3	2.8 (NP)	150 J	2.8	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Dibromochloromethane	µg/L	0.41	0.34 (NP)	1.2	0.34	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2-Dichlorobenzene	µg/L	6.8	2.1 (NP)	56	2.1	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,3-Dichlorobenzene	µg/L	11	5.2 (NP)	120	5.2	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,4-Dichlorobenzene	µg/L	14	5.0 (NP)	110	5.0	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1-Dichloroethane	µg/L	1.1	0.70 (NP)	26 J	0.70	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2-Dichloroethane	µg/L	1.2	0.56 (NP)	15	0.56	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1-Dichloroethene	µg/L	8.5	5.7 (NP)	280 J	5.7	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	cis-1,2-Dichloroethene	µg/L	4,407	14,139 (NP)	390,000 J	14,139	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	trans-1,2-Dichloroethene	µg/L	52	61 (NP)	1,300 J	61	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Methyl tert-butyl ether	µg/L	10	13 (NP)	330	13	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Methylene chloride	µg/L	1.3	0.50 (NP)	7 J	0.50	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Tetrachloroethene	µg/L	20	36 (NP)	1,600	36	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2,3-Trichlorobenzene	µg/L	19	8.5 (NP)	280	8.5	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2,4-Trichlorobenzene	µg/L	89	58 (NP)	1,600 J	58	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1,2-Trichloroethane	µg/L	10	3.9 (NP)	120	3.9	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Trichloroethene	µg/L	2,444	7,041 (NP)	170,000	7,041	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Vinyl chloride	µg/L	74	53 (NP)	860 J	53	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	bis(2-Ethylhexyl)phthalate	µg/L	14	5.7 (NP)	26	5.7	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Dibenzo(a,h)anthracene	µg/L	0.38	0.17 (NP)	5.5	0.17	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Indeno(1,2,3-cd)pyrene	µg/L	0.24	0.14 (NP)	3.1 J	0.14	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Naphthalene	µg/L	0.64	0.34 (NP)	14 J	0.34	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Total PCB Aroclors	µg/L	5.1	4.4 (NP)	81	4.4	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	gamma-Chlordane	µg/L	2.5	0.75 (NP)	21 J	0.75	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	4,4'-DDD	µg/L	0.65	0.23 (NP)	2.2 JN	0.23	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	4,4'-DDE	µg/L	1.8	0.27 (NP)	9.8	0.27	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	4,4'-DDT	µg/L	2.3	0.49 (NP)	17 J	0.49	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Heptachlor	µg/L	9.2	3.6 (NP)	120 J	3.6	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	2,3,7,8-TCDD Toxic Equivalence (TEQ) [3]	µg/L	5.5E-06	2.6E-05 (NP)	5.4E-05	2.6E-05	µg/L	99% Chebyshev (Mean, Sd) UCL	Potential UCL to use from ProUCL v4.1.00
	Aluminum	µg/L	437	268 (NP)	6,210	268	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Arsenic	µg/L	48	76 (NP)	829	76	µg/L	95% Chebyshev (Mean, Sd) UCL	Potential UCL to use from ProUCL v4.1.00
	Barium	µg/L	325	544 (NP)	8,790	544	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Cadmium	µg/L	1.3	0.56 (NP)	16.8	0.56	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Chromium	µg/L	2.8	2.3 (NP)	96.8	2.3	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Cobalt	µg/L	0.56	0.42 (NP)	6.6	0.42	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Iron	µg/L	751	538 (NP)	8,520	538	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Lead	µg/L	2.6	N/A	32.9	2.6	µg/L	Arithmetic average concentration, including 1/2 reporting limits for non-detected values	Per USEPA ALM and IEUBK Model for Lead in Children guidance
	Manganese	µg/L	206	319 (NP)	2,020	319	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Vanadium	µg/L	7.8	7.4 (NP)	30	7.4	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00

Notes
[1] The arithmetic mean of detected concentrations only is presented
[2] The 95% Upper Confidence Level (UCL) on the arithmetic average concentration (i.e., the 95% UCL concentration) was calculated using ProUCL version 4.1.0(
[3] Represents the sum of dioxin/furan TEQ and PCB congeners TEQ. 95% UCL concentration was calculated using detected concentrations only.
N/A = Not Applicable

Data Distribution Codes:
NP = Nonparametric; data follow no discernible distribution

Qualifier Codes:
J - indicates an estimated value
N - indicates presumptive evidence of a compound

TABLE 3.2

EXPOSURE POINT CONCENTRATION SUMMARY - SHALLOW ONSITE GROUNDWATER

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Onsite Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL Concentration [2] (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Within the Boundaries of the Former CDE Facility - Excavation	Benzene	µg/L	2.7	3.0 (NP)	24	3.0	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Chlorobenzene	µg/L	19	17 (NP)	65	17	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Chloroform	µg/L	3.5	2.8 (NP)	19	2.8	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2-Dibromo-3-chloropropane	µg/L	0.13	0.08 (NP)	0.39 J	0.08	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Dibromochloromethane	µg/L	0.82	0.55 (NP)	1.2	0.55	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2-Dichlorobenzene	µg/L	7.9	7.2 (NP)	56	7.2	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,3-Dichlorobenzene	µg/L	14	14 (NP)	120	14	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,4-Dichlorobenzene	µg/L	23	19 (NP)	110	19	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1-Dichloroethane	µg/L	3.1	2.9 (NP)	11	2.9	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2-Dichloroethane	µg/L	3.3	4.6 (NP)	15	4.6	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1-Dichloroethene	µg/L	28	68 (NP)	280 J	68	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	cis-1,2-Dichloroethene	µg/L	21,780	139,569 (NP)	390,000 J	139,569	µg/L	99% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	trans-1,2-Dichloroethene	µg/L	137	581 (NP)	1,300 J	581	µg/L	99% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Ethylbenzene	µg/L	10	11 (NP)	20	11	µg/L	99% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Methylcyclohexane	µg/L	11	5.9 (NP)	42	5.9	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Methylene chloride	µg/L	2.1	7 (NP)	7 J	7	µg/L	Maximum detected	ProUCL output indicates N/A (number of detected data is not adequate enough)
	Tetrachloroethene	µg/L	98	535 (NP)	1,600	535	µg/L	99% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2,3-Trichlorobenzene	µg/L	30	74 (NP)	280	74	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,2,4-Trichlorobenzene	µg/L	144	179 (NP)	1,600 J	179	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1,2-Trichloroethane	µg/L	18	14 (NP)	120	14	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Trichloroethene	µg/L	11,107	23,103 (G)	170,000	23,103	µg/L	95% Adjusted Gamma UCL	Potential UCL to use from ProUCL v4.1.00
	o-Xylene	µg/L	29	38 (NP)	85	38	µg/L	99% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Vinyl chloride	µg/L	139	158 (NP)	860 J	158	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Benzo(a)anthracene	µg/L	0.94	0.61 (NP)	1.7	0.61	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Benzo(a)pyrene	µg/L	0.95	0.35 (NP)	2.5 J	0.35	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Benzo(b)fluoranthene	µg/L	1.2	N/A	2.1 J	2.1	µg/L	Maximum detected	ProUCL output indicates N/A (number of detected data is not adequate enough)
	Benzo(g,h,i)perylene	µg/L	0.95	0.37 (NP)	2.4 J	0.37	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Benzo(k)fluoranthene	µg/L	1.1	0.72 (NP)	2 J	0.72	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	1,1-Biphenyl	µg/L	1.7	2.7 (NP)	2.3 J	2.7	µg/L	Maximum detected	Recommended UCL exceeds maximum detected concentration
	Dibenzo(a,h)anthracene	µg/L	1.2	1.4 (NP)	5.5	1.4	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Indeno(1,2,3-cd)pyrene	µg/L	0.64	0.38 (NP)	3.1 J	0.38	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Naphthalene	µg/L	1.3	2.0 (NP)	6.5	2.0	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Phenanthrene	µg/L	0.82	0.52 (NP)	1.5	0.52	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00

TABLE 3.2

EXPOSURE POINT CONCENTRATION SUMMARY - SHALLOW ONSITE GROUNDWATER

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Onsite Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL Concentration [2] (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Within the Boundaries of the Former CDE Facility - Excavation	Total PCB Aroclors	µg/L	10	12 (NP)	81	12	µg/L	95% UCL concentration	95% KM (BCA) UCL
	alpha-BHC	µg/L	0.75	0.49 (NP)	2.7	0.49	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	delta-BHC	µg/L	2.0	1.4 (NP)	3.6 J	1.4	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	gamma-BHC	µg/L	0.58	0.20 (NP)	1.3 J	0.20	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	gamma-Chlordane	µg/L	4.5	2.2 (NP)	21 J	2.2	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	4,4'-DDD	µg/L	0.67	0.59 (NP)	2.2 JN	0.59	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	4,4'-DDE	µg/L	2.5	1.3 (NP)	9.8	1.3	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	4,4'-DDT	µg/L	3.2	2.0 (NP)	17 J	2.0	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Dieldrin	µg/L	0.96	0.47 (NP)	3.1 JN	0.47	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Endosulfan II	µg/L	3.1	1.1 (NP)	8.5	1.1	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Endosulfan sulfate	µg/L	1.2	0.45 (NP)	3.1 NJ	0.45	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Endrin aldehyde	µg/L	2.5	0.77 (NP)	5.7	0.77	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Heptachlor	µg/L	1.7	0.87 (NP)	5.1	0.87	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	2,3,7,8-TCDD Toxic Equivalence (TEQ) [3]	µg/L	1.8E-05	7.1E-05 (NP)	5.4E-05	5.4E-05	µg/L	Maximum detected	Recommended UCL exceeds maximum detected concentration
	Aluminum	µg/L	755	1,842 (NP)	6,210	1,842	µg/L	95% UCL concentration	97.5% KM (Chebyshev) UCL
	Arsenic	µg/L	34	140 (NP)	829	140	µg/L	95% UCL concentration	95% KM Chebyshev (Mean,Sd) UCL
	Barium	µg/L	615	819 (G)	2,650	819	µg/L	95% UCL concentration	95% Approximate Gamma UCL
	Cadmium	µg/L	4.2	3.3 (NP)	17	3.0	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00
	Chromium	µg/L	10	29 (NP)	97	29	µg/L	95% UCL concentration	97.5% KM (Chebyshev) UCL
	Cobalt	µg/L	1.0	0.93 (NP)	3.5	0.93	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Iron	µg/L	1,306	2,731 (NP)	8,520	2,731	µg/L	95% UCL concentration	95% KM (Chebyshev) UCL
	Lead	µg/L	4.1	N/A	33	3.0	µg/L	Arithmetic average concentration, including 1/2 reporting limits for non detected values	Per USEPA ALM and IEUBK Model for Lead in Children guidance
	Manganese	µg/L	467	665 (G)	1,660	665	µg/L	95% Approximate Gamma UCL	Potential UCL to use from ProUCL v4.1.00
	Vanadium	µg/L	7.7	7.8 (NP)	30	7.8	µg/L	95% UCL concentration	95% KM (Percentile Bootstrap) UCL

Notes

[1] The arithmetic mean of detected concentrations only is presented.

[2] The 95% Upper Confidence Level (UCL) on the arithmetic average concentration (i.e., the 95% UCL concentration) was calculated using ProUCL version 4.1.00.

[3] Represents the sum of dioxin/furan TEQ and PCB congeners TEQ. 95% UCL concentration was calculated using detected concentrations only.

N/A = Not Applicable

Data Distribution Codes:
G = Gamma or Approximate Gamma
NP = Nonparametric; data follow no discernible distribution

Qualifier Codes:
J - indicates an estimated value
N - indicates presumptive evidence of a compound

TABLE 3.3

EXPOSURE POINT CONCENTRATION SUMMARY - SHALLOW OFFSITE GROUNDWATER, SOUTH OF BOUND BROOK

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Offsite Groundwater, South of Bound Brook

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL Concentration [2] (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Outside the Boundaries of the Former CDE Facility - Excavation	Benzene	µg/L	N/A	N/A	0.5	0.5	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Chloroform	µg/L	N/A	N/A	1.1	1.1	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Dibromochloromethane	µg/L	N/A	N/A	0.51	0.51	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	cis-1,2-Dichloroethene	µg/L	15	17 (NP)	31	17	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Methyl tert-butyl ether	µg/L	163	190 (NP)	330	190	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Tetrachloroethene	µg/L	N/A	N/A	1.9	1.9	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Trichloroethene	µg/L	1,210	1,137 (NP)	1,800	1,137	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Dibenzo(a,h)anthracene	µg/L	N/A	N/A	2.4 J	2.4	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Indeno(1,2,3-cd)pyrene	µg/L	N/A	N/A	0.11 J	0.11	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Naphthalene	µg/L	0.13	0.013 (NP)	0.18	0.13	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Total PCB Aroclors	µg/L	5.1	N/A	5.1 JN	5.1	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	2,3,7,8-TCDD Toxic Equivalence (TEQ) [3]	µg/L	9.1E-07	N/A	1.7E-06	1.7E-06	µg/L	Maximum detected	Data set consists of two samples.
	Arsenic	µg/L	13	37 (NP)	69	37	µg/L	95% Approximate Gamma UCL	Potential UCL to use from ProUCL v4.1.00
	Barium	µg/L	2,609	8,292 (NP)	8,790	8,292	µg/L	95% Chebyshev (Mean, Sd) UCL	Potential UCL to use from ProUCL v4.1.00
	Chromium	µg/L	0.51	N/A	0.57 J	0.57	µg/L	Maximum detected	95% KM (t) UCL is greater than the maximum detected concentration. Bootstrap methods are not reliable for data sets with only two distinct detected values.
	Manganese	µg/L	213	324 (NP)	484	324	µg/L	95% Student's-t UCL	Potential UCL to use from ProUCL v4.1.00

Notes

[1] The arithmetic mean of detected concentrations only is presented.

[2] The 95% Upper Confidence Level (UCL) on the arithmetic average concentration (i.e., the 95% UCL concentration) was calculated using ProUCL version 4.1.00.

[3] Represents the sum of dioxin/furan TEQ and PCB congeners TEQ.

N/A = Not Applicable

Qualifier Codes:

J - indicates an estimated value

N - indicates presumptive evidence of a compound

TABLE 3.4

EXPOSURE POINT CONCENTRATION SUMMARY - SHALLOW OFFSITE GROUNDWATER, NORTH OF BOUND BROOK

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Offsite Groundwater, North of Bound Brook

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL Concentration [2] (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Outside the Boundaries of the Former CDE Facility - Excavation	Benzene	µg/L	1.0	1.2 (NP)	1.8	1.2	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Bromodichloromethane	µg/L	0.48	0.35 (NP)	0.7	0.35	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Chloroform	µg/L	1.9	1.4 (NP)	3	1.4	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	cis-1,2-Dichloroethene	µg/L	22	49 (NP)	110	49	µg/L	95% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Tetrachloroethene	µg/L	0.43	0.38 (NP)	0.81	0.38	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Trichloroethene	µg/L	42	237 (NP)	310	237	µg/L	99% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Vinyl chloride	µg/L	0.36	N/A	0.36 J	0.36	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Benzo(g,h,i)perylene	µg/L	0.098	N/A	0.098 J	0.098	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	bis(2-Ethylhexyl)phthalate	µg/L	5.2	N/A	5.2	5.2	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Indeno(1,2,3-cd)pyrene	µg/L	0.14	0.12 (NP)	0.15	0.12	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Naphthalene	µg/L	0.13	0.11 (NP)	0.16	0.11	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Total PCB Aroclors	µg/L	0.90	0.48 (NP)	2.2	0.48	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	beta-BHC	µg/L	0.35	N/A	0.35	0.35	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	delta-BHC	µg/L	0.42	N/A	0.42	0.42	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	4,4'-DDD	µg/L	0.44	N/A	0.76 NJ	0.76	µg/L	Maximum detected	ProUCL output indicates data set is too small for meaningul results.
	4,4'-DDE	µg/L	0.75	N/A	0.75 J	0.75	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	4,4'-DDT	µg/L	0.83	0.96 (NP)	1.5 J	0.96	µg/L	97.5% KM (Chebyshev) UCL	Potential UCL to use from ProUCL v4.1.00
	Heptachlor	µg/L	0.2	N/A	0.2	0.2	µg/L	Maximum detected	Data set consists of only one distinct detected value.
	Antimony	µg/L	2.2	N/A	2.2	2.2	µg/L	Maximum detected	ProUCL output indicates data set is too small for meaningul results.
	Arsenic	µg/L	52	107 (G)	180	107	µg/L	95% Approximate Gamma UCL	Potential UCL to use from ProUCL v4.1.00
	Chromium	µg/L	1.1	1.2 (NP)	3.5	1.2	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Cobalt	µg/L	0.41	0.43 (NP)	1.4	0.43	µg/L	95% KM (t) UCL	Potential UCL to use from ProUCL v4.1.00
	Lead	µg/L	3.5	N/A	20.9	3.3	µg/L	Arithmetic average concentration, including 1/2 reporting limits for non detected values	Per USEPA ALM and IEUBK Model for Lead in Children guidance
	Manganese	µg/L	242	587 (G)	1,580 J	587	µg/L	95% Adjusted Gamma UCL	Potential UCL to use from ProUCL v4.1.00
	Vanadium	µg/L	6.9	8.4 (NP)	20.5	8.4	µg/L	95% KM (BCA) UCL	Potential UCL to use from ProUCL v4.1.00

Notes

[1] The arithmetic mean of detected concentrations only is presented.

[2] The 95% Upper Confidence Level (UCL) on the arithmetic average concentration (i.e., the 95% UCL concentration) was calculated using ProUCL version 4.1.00.

N/A = Not Applicable

Data Distribution Codes:

G = Gamma or Approximate Gamma

NP = Nonparametric; data follow no discernible distribution

Qualifier Codes:

J - indicates an estimated value

N - indicates presumptive evidence of a compound

TABLE 4.1RME
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Entire Aquifer

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Dermal	Commercial / Industrial Worker	Adult	Process Water	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				AF1	Apportionment Factor 1 (for VOCs)	0.9	unitless	USEPA, Region 2	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-7	where for organic chemicals:
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-7	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2002b	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-7	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t-event	Event Duration	8	hours/event	(2)	or
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-7	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/(1 + B)^2)}
				B	Ratio of permeability coefficient of a	Chemical-specific	unitless	See Table E-7	
				EV	Event Frequency	1	events/day	USEPA, 2002b	and where for inorganic chemicals:
				EF	Exposure Frequency	250	days/year	USEPA, 2002b	
				ED	Exposure Duration	25	years	USEPA, 2002b	DA_{event} = Kp x CW x t-event x CF
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix

TABLE 4.1CT
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Entire Aquifer

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Dermal	Commercial / Industrial Worker	Adult	Process Water	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				AF1	Apportionment Factor 1 (for VOCs)	0.5	unitless	USEPA, Region 2	DA$_{event}$ x EV x ED x EF x SA x 1/BW x 1/AT
				DA$_{event}$	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-7	where for organic chemicals:
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-7	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2002b	Absorbed Dose per Event (DA$_{event}$) (mg/cm^2-event) =
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-7	If t-event < t*, then: DA$_{event}$ = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t-event	Event Duration	6	hours/event	(2)	or
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-7	If t-event > t*, then: DA$_{event}$ = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/(1 + B)^2)}
				B	Ratio of permeability coefficient of a	Chemical-specific	unitless	See Table E-7	
				EV	Event Frequency	1	events/day	USEPA, 2002b	and where for inorganic chemicals:
				EF	Exposure Frequency	250	days/year	USEPA, 2002b	
				ED	Exposure Duration	6.6	years	USEPA, 1997b	DA$_{event}$ = Kp x CW x t-event x CF
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	2,409	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E.

TABLE 4.2RME

VALUES USED FOR DAILY EXPOSURE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Inhalation	Commercial / Industrial Worker	Adult	Workplace Air	CA	Chemical Concentration in Air	See Table E-1	$\mu g/m^3$	See Appendix E	Exposure Concentration (EC) ($\mu g/m^3$) = (CA x ET x EF x ED)/AT
				ET	Exposure Time	8	hours/day	(2)	
				EF	Exposure Frequency	250	days/year	USEPA, 2002b	
				ED	Exposure Duration	25	years	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	219,000	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	

Notes

(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E

(2) Professional judgment

TABLE 4.2CT
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future Medium: Groundwater Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Inhalation	Commercial / Industrial Worker	Adult	Workplace Air	CA	Chemical Concentration in Air	See Table E-1	$\mu g/m^3$	See Appendix E	Exposure Concentration (EC) ($\mu g/m^3$) = (CA x ET x EF x ED)/AT
				ET	Exposure Time	6	hours/day	(2)	
				EF	Exposure Frequency	250	days/year	USEPA, 2002b	
				ED	Exposure Duration	6.6	years	USEPA, 1997b	
				AT-N	Averaging Time (Non-Cancer)	57,816	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E
(2) Professional judgment

TABLE 4.3RME
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Dermal	Construction/Utility Worker	Adult	Top of the Groundwater Table	CW	Chemical Concentration in Groundwater	See Tables 3.2, 3.3., and 3.4	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-8	
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-8	where for organic chemicals:
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2002b	
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-8	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				t-event	Event Duration	8	hours/event	USEPA, 1997b	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-8	or
				B	Ratio of permeability coefficient of a chemical through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical-specific	unitless	See Table E-8	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/$(1 + B)^2$)}
				EV	Event Frequency	1	events/day	USEPA, 2002b	
				EF	Exposure Frequency	60	days/year	(2)	and where for inorganic chemicals:
				ED	Exposure Duration	1	years	(2)	
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	DA_{event} = Kp x CW x t-event x CF
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	82	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix
(2) Professional judgment

TABLE 4.3CT
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Dermal	Construction/Utility Worker	Adult	Top of the Groundwater Table	CW	Chemical Concentration in Groundwater	See Tables 3.2, 3.3., and 3.4	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-8	
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-8	where for organic chemicals:
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2002b	
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-8	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				t-event	Event Duration	6	hours/event	(2)	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t*	Time to reach steady-state = 2.4 x tau-even	Chemical-specific	hours	See Table E-8	or
				B	Ratio of permeability coefficient of a chemical through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical-specific	unitless	See Table E-8	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/(1 + B)^2)}
				EV	Event Frequency	1	events/day	USEPA, 2002b	
				EF	Exposure Frequency	20	days/year	(2)	and where for inorganic chemicals:
				ED	Exposure Duration	1	years	(2)	
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	DA_{event} = Kp x CW x t-event x CF
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	26	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E.
(2) Professional judgment

TABLE 4.4RME
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Inhalation	Construction/Utility Worker	Adult	Outdoor Air Around an Excavation	CA	Chemical Concentration in Air	See Tables E-2, E-3, and E-4	$\mu g/m^3$	See Appendix E	Exposure Concentration (EC) ($\mu g/m^3$) =
				ET	Exposure Time	8	hours/day	USEPA, 1997b	(CA x ET x EF x ED)/AT
				EF	Exposure Frequency	5	days/week	(2)	
				ED	Exposure Duration	12	weeks	(2)	
				AT-N	Averaging Time (Non-Cancer)	1,968	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E
(2) Professional judgment

TABLE 4.4CT

VALUES USED FOR DAILY EXPOSURE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Inhalation	Construction/Utility Worker	Adult	Outdoor Air Around an Excavation	CA	Chemical Concentration in Air	See Tables E-2, E-3, and E-4	$\mu g/m^3$	See Appendix E	Exposure Concentration (EC) ($\mu g/m^3$) =
				ET	Exposure Time	6	hours/day	(2)	(CA x ET x EF x ED)/AT
				EF	Exposure Frequency	5	days/week	(2)	
				ED	Exposure Duration	4	weeks	(2)	
				AT-N	Averaging Time (Non-Cancer)	624	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	

Notes

(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E

(2) Professional judgment

TABLE 4.5RME
VALUES USED FOR DAILY INTAKE/EXPOSURE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Entire Aquifer

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake/Exposure Equation/ Model Name (1)
Ingestion	Resident	Adult	Tap Water	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Groundwater	2	L/day	USEPA, 2002b	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	30/24 *	years	USEPA, 2002b	
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	
		Child	Tap Water	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Groundwater	1	L/day	USEPA, 2002b	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	6	years	USEPA, 2002b	
				BW	Body Weight	15	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	--	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	
Dermal	Resident	Adult	Shower	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				AF1	Apportionment Factor 1 (for VOCs)	0.9	unitless	USEPA, Region 2	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-9	where for organic chemicals:
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-9	
				SA	Skin Surface Area Available for Contact	18,000	cm^2	USEPA, 2004	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-9	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t-event	Event Duration	0.25	hours/event	USEPA, 2003a	
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-9	or
				B	Ratio of permeability coefficient of a chemical through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical-specific	unitless	See Table E-9	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x $((1 + (3 x B) + (3 x B x B))/(1 + B)^2)$}
				EV	Event Frequency	1	events/day	USEPA, 2002b	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	and where for inorganic chemicals:
				ED	Exposure Duration	30/24 *	years	USEPA, 2002b	
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	DA_{event} = Kp x CW x t-event x CF
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

TABLE 4.5RME

VALUES USED FOR DAILY INTAKE/EXPOSURE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Entire Aquifer

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake/Exposure Equation/ Model Name (1)
Dermal	Resident	Child	Shower	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				AF1	Apportionment Factor 1 (for VOCs)	0.9	unitless	USEPA, Region 2	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-10	where for organic chemicals:
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-10	
				SA	Skin Surface Area Available for Contact	6,600	cm^2	USEPA, 2004	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-10	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t-event	Event Duration	0.45	hours/event	USEPA, 2003a	
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-10	or
				B	Ratio of permeability coefficient of a chemical through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical-specific	unitless	See Table E-10	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/(1 + B)2)}
				EV	Event Frequency	1	events/day	USEPA, 2002b	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	and where for inorganic chemicals:
				ED	Exposure Duration	6	years	USEPA, 2002b	
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	DA_{event} = Kp x CW x t-event x CF
				BW	Body Weight	15	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

Notes

(1) Information regarding modeled intake/exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E.

* = For the adult resident, non-cancer hazard quotients are computed based on an exposure duration of 30 years as an adult. A combined adult/child cancer risk (rather than a strictly adult cancer risk) is computed as six years at the child's rate of exposure and 24 years at the adult's rate of exposure (USEF
1991).

TABLE 4.5CT
VALUES USED FOR DAILY INTAKE/EXPOSURE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Entire Aquifer

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake/Exposure Equation/ Model Name (1)
Ingestion	Resident	Adult	Tap Water	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Groundwater	1	L/day	(2)	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	9	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	
		Child	Tap Water	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Groundwater	0.5	L/day	(2)	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	6	years	USEPA, 2002b	
				BW	Body Weight	15	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	--	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	
Dermal	Resident	Adult	Shower	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				AF1	Apportionment Factor 1 (for VOCs)	0.5	unitless	USEPA, Region 2	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-9	where for organic chemicals:
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-9	
				SA	Skin Surface Area Available for Contact	18,000	cm^2	USEPA, 2004	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-9	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t-event	Event Duration	0.11	hours/event	(2)	
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-9	or
				B	Ratio of permeability coefficient of a chemical through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical-specific	unitless	See Table E-9	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/$(1 + B)^2$)}
				EV	Event Frequency	1	events/day	USEPA, 2002b	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	and where for inorganic chemicals:
				ED	Exposure Duration	9	years	USEPA, 1989	
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	DA_{event} = Kp x CW x t-event x CF
				BW	Body Weight	70	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

TABLE 4.5CT
VALUES USED FOR DAILY INTAKE/EXPOSURE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Entire Aquifer

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake/Exposure Equation/ Model Name (1)
Dermal	Resident	Child	Shower	CW	Chemical Concentration in Groundwater	See Table 3.1	mg/L	--	Dermally Absorbed Dose (DAD) (mg/kg-day) =
				AF1	Apportionment Factor 1 (for VOCs)	0.5	unitless	USEPA, Region 2	DA_{event} x EV x ED x EF x SA x 1/BW x 1/AT
				DA_{event}	Absorbed dose per event	Chemical-specific	mg/cm^2-event	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical-specific	unitless	See Table E-10	where for organic chemicals:
				Kp	Permeability Coefficient	Chemical-specific	cm/hour	See Table E-10	
				SA	Skin Surface Area Available for Contact	6,600	cm^2	USEPA, 2004	Absorbed Dose per Event (DA_{event}) (mg/cm^2-event) =
				tau-event	Lag time per event	Chemical-specific	hours/event	See Table E-10	If t-event < t*, then: DA_{event} = 2FA x Kp x CW x AF1(VOCs only) x CF x SQRT{(6 x tau-event x t-event)/pi}
				t-event	Event Duration	0.15	hours/event	(2)	
				t*	Time to reach steady-state = 2.4 x tau-event	Chemical-specific	hours	See Table E-10	or
				B	Ratio of permeability coefficient of a chemical through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical-specific	unitless	See Table E-10	If t-event > t*, then: DA_{event} = FA x Kp x CW x AF1(VOCs only) x CF x {(t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/(1 + B)2)}
				EV	Event Frequency	1	events/day	USEPA, 2002b	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	and where for inorganic chemicals:
				ED	Exposure Duration	6	years	USEPA, 2002b	
				CF	Volumetric Conversion Factor for Water	0.001	L/cm^3	--	DA_{event} = Kp x CW x t-event x CF
				BW	Body Weight	15	kg	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	- -	
				AT-C	Averaging Time (Cancer)	25,550	days	- -	

Notes
(1) Information regarding modeled intake/exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix
(2) Professional judgmen

TABLE 4.6RME

VALUES USED FOR DAILY EXPOSURE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Inhalation	Resident	Adult	Bathroom Air	CA	Chemical Concentration in Air	See Table E-5	μg/m^3	See Appendix E	Exposure Concentration (EC) (μg/m^3) = (CA x ET x EF x ED)/AT
				ET	Exposure Time	0.58	hours/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	30/24 *	years	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	262,800	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	
		Child	Bathroom Air	CA	Chemical Concentration in Air	See Table E-6	μg/m^3	See Appendix E	Exposure Concentration (EC) (μg/m^3) = (CA x ET x EF x ED)/AT
				ET	Exposure Time	1	hours/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	6	years	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	52,560	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	

Notes

(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E.

* = For the adult resident, non-cancer hazard quotients are computed based on an exposure duration of 30 years as an adult. A combined adult/child cancer risk (rather than a strictly adult cancer risk) is computed as six years at the child's rate of exposure and 24 years at the adult's rate of exposure (USEPA, 1991).

TABLE 4.6CT
VALUES USED FOR DAILY EXPOSURE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Exposure Equation/ Model Name (1)
Inhalation	Resident	Adult	Bathroom Air	CA	Chemical Concentration in Air	See Table E-5	$\mu g/m^3$	See Appendix E	Exposure Concentration (EC) ($\mu g/m^3$) = (CA x ET x EF x ED)/AT
				ET	Exposure Time	0.25	hours/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	9	years	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	78,840	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	
		Child	Bathroom Air	CA	Chemical Concentration in Air	See Table E-6	$\mu g/m^3$	See Appendix E	Exposure Concentration (EC) ($\mu g/m^3$) = (CA x ET x EF x ED)/AT
				ET	Exposure Time	0.33	hours/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED	Exposure Duration	6	years	USEPA, 2002b	
				AT-N	Averaging Time (Non-Cancer)	52,560	hours	USEPA, 2009a	
				AT-C	Averaging Time (Cancer)	613,200	hours	- -	

Notes
(1) Information regarding modeled exposure can be found in Section 3.4, Estimates of Chemical Intake/Exposure and Appendix E.

TABLE 4.7RME
CALCULATION OF AGE-ADJUSTED EXPOSURE FACTORS FOR RESIDENT ADULTS AND CHILDREN
REASONABLE MAXIMUM EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

						Age-Adjusted Chronic Daily Intakes (CDI) for Cancer Risk Assessment				
Age (year)	Exposure Duration (ED) (years)	Exposure Frequency (EF) (days)	Body Weight [1] (BW) (kg)	Ingestion Rate of Groundwater [2] (IR-W) (L/day)	Skin Surface Area Available for Contact [3] (SA) (cm^2)	Age Group	Groundwater Ingestion CDI (L/kg-day)	Dermal CDI (cm^2-event/kg-day)	Ingestion CDI (L/kg-day)	Dermal CDI (cm^2-event/kg-day)
0	1	350	6.8	1	3,600	**0-<2 yrs Average**	**1.6E-03**	**6.8E+00**	2.0E-03	7.3E+00
1	1	350	11.4	1	5,300				1.2E-03	6.4E+00
2	1	350	13.5	1	6,020	**2-<6 yrs Average**	**8.3E-04**	**5.8E+00**	1.0E-03	6.1E+00
3	1	350	15.55	1	6,694				8.8E-04	5.9E+00
4	1	350	18.2	1	7,506				7.5E-04	5.6E+00
5	1	350	20.95	1	8,274				6.5E-04	5.4E+00
6	1	350	22.95	2	8,847	**6-<16 yrs Average**	**7.0E-04**	**4.3E+00**	1.2E-03	5.3E+00
7	1	350	26.55	2	9,775				1.0E-03	5.0E+00
8	1	350	32.3	2	11,043				8.5E-04	4.7E+00
9	1	350	35.7	2	11,840				7.7E-04	4.5E+00
10	1	350	39.3	2	12,623				7.0E-04	4.4E+00
11	1	350	45.8	2	13,963				6.0E-04	4.2E+00
12	1	350	51.2	2	15,010				5.4E-04	4.0E+00
13	1	350	55.8	2	15,865				4.9E-04	3.9E+00
14	1	350	61.9	2	16,980				4.4E-04	3.8E+00
15	1	350	64.7	2	17,492				4.2E-04	3.7E+00
16	1	350	68.7	2	18,000	**16-<30 yrs Average**	**3.8E-04**	**3.5E+00**	4.0E-04	3.6E+00
17	1	350	68.65	2	18,000				4.0E-04	3.6E+00
18	1	350	71.8	2	18,000				3.8E-04	3.4E+00
19	1	350	71.8	2	18,000				3.8E-04	3.4E+00
20	1	350	71.8	2	18,000				3.8E-04	3.4E+00
21	1	350	71.8	2	18,000				3.8E-04	3.4E+00
22	1	350	71.8	2	18,000				3.8E-04	3.4E+00
23	1	350	71.8	2	18,000				3.8E-04	3.4E+00
24	1	350	71.8	2	18,000				3.8E-04	3.4E+00
25	1	350	71.8	2	18,000				3.8E-04	3.4E+00
26	1	350	71.8	2	18,000				3.8E-04	3.4E+00
27	1	350	71.8	2	18,000				3.8E-04	3.4E+00
28	1	350	71.8	2	18,000				3.8E-04	3.4E+00
29	1	350	71.8	2	18,000				3.8E-04	3.4E+00

Equations: Chronic Daily Intake (CDI) (L/kg-day) =

Ingestion:
IR x EF x ED / (BW x AT)

Dermal:
SA x EV x EF x ED / (BW x AT)

where: AT = Averaging time - Cancer (days) = 25,550

Notes

[1] Body weights are mean values for males and females; for ages 0-1 and 2-17, respectively, from Tables 8-3 and 8-13 in Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 18-29, the recommended value for 18-75 years from Table 7-2 in Exposure Factors Handbook (USEPA, 1997b).

[2] Drinking water ingestion rate are recommended values in Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, 2002b

[3] Total body surface areas for males and females; for ages 0-1, from Table 7-1 of Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 0-15, based on Equation 7A-3 in Appendix 7A of Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 16-29, the default value for adults from Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) (USEPA, 2004).

TABLE 4.7CT
CALCULATION OF AGE-ADJUSTED EXPOSURE FACTORS FOR RESIDENT ADULTS AND CHILDREN
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

						Age-Adjusted Chronic Daily Intakes (CDI) for Cancer Risk Assessment				
Age (year)	Exposure Duration (ED) (years)	Exposure Frequency (EF) (days)	Body Weight [1] (BW) (kg)	Ingestion Rate of Groundwater [2] (IR-W) (L/day)	Skin Surface Area Available for Contact [3] (SA) (cm^2)	Age Group	Groundwater Ingestion CDI (L/kg-day)	Dermal CDI (cm^2-event/kg-day)	Ingestion CDI (L/kg-day)	Dermal CDI (cm^2-event/kg-day)
0	1	350	6.8	0.5	3,600	**0-<2 yrs Average**	**8.0E-04**	**6.8E+00**	1.0E-03	7.3E+00
1	1	350	11.4	0.5	5,300				6.0E-04	6.4E+00
2	1	350	13.5	0.5	6,020	**2-<6 yrs Average**	**4.1E-04**	**5.8E+00**	5.1E-04	6.1E+00
3	1	350	15.55	0.5	6,694				4.4E-04	5.9E+00
4	1	350	18.2	0.5	7,506				3.8E-04	5.6E+00
5	1	350	20.95	0.5	8,274				3.3E-04	5.4E+00
6	1	350	22.95	1	8,847	**6-<16 yrs Average**	**3.5E-04**	**4.3E+00**	6.0E-04	5.3E+00
7	1	350	26.55	1	9,775				5.2E-04	5.0E+00
8	1	350	32.3	1	11,043				4.2E-04	4.7E+00
9	1	350	35.7	1	11,840				3.8E-04	4.5E+00
10	1	350	39.3	1	12,623				3.5E-04	4.4E+00
11	1	350	45.8	1	13,963				3.0E-04	4.2E+00
12	1	350	51.2	1	15,010				2.7E-04	4.0E+00
13	1	350	55.8	1	15,865				2.5E-04	3.9E+00
14	1	350	61.9	1	16,980				2.2E-04	3.8E+00
15	1	350	64.7	1	17,492				2.1E-04	3.7E+00
16	1	350	68.7	1	18,000	**16-<30 yrs Average**	**1.9E-04**	**3.5E+00**	2.0E-04	3.6E+00
17	1	350	68.65	1	18,000				2.0E-04	3.6E+00
18	1	350	71.8	1	18,000				1.9E-04	3.4E+00
19	1	350	71.8	1	18,000				1.9E-04	3.4E+00
20	1	350	71.8	1	18,000				1.9E-04	3.4E+00
21	1	350	71.8	1	18,000				1.9E-04	3.4E+00
22	1	350	71.8	1	18,000				1.9E-04	3.4E+00
23	1	350	71.8	1	18,000				1.9E-04	3.4E+00
24	1	350	71.8	1	18,000				1.9E-04	3.4E+00
25	1	350	71.8	1	18,000				1.9E-04	3.4E+00
26	1	350	71.8	1	18,000				1.9E-04	3.4E+00
27	1	350	71.8	1	18,000				1.9E-04	3.4E+00
28	1	350	71.8	1	18,000				1.9E-04	3.4E+00
29	1	350	71.8	1	18,000				1.9E-04	3.4E+00

Equations: Chronic Daily Intake (CDI) (L/kg-day) =

Ingestion:
IR x EF x ED / (BW x AT)

Dermal:
SA x EV x EF x ED / (BW x AT)

where: AT = Averaging time - Cancer (days) = 25,550

Notes

[1] Body weights are mean values for males and females; for ages 0-1 and 2-17, respectively, from Tables 8-3 and 8-13 in Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 18-29, the recommended value for 18-75 years from Table 7-2 in Exposure Factors Handbook (USEPA, 1997b).

[2] Drinking water ingestion rate are based on professional judgment

[3] Total body surface areas for males and females; for ages 0-1, from Table 7-1 of Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 0-15, based on Equation 7A-3 in Appendix 7A of Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 16-29, the default value for adults from Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) (USEPA, 2004).

TABLE 4.7CT
CALCULATION OF AGE-ADJUSTED EXPOSURE FACTORS FOR RESIDENT ADULTS AND CHILDREN
CENTRAL TENDENCY EXPOSURE
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

						Age-Adjusted Chronic Daily Intakes (CDI) for Cancer Risk Assessment				
Age (year)	Exposure Duration (ED) (years)	Exposure Frequency (EF) (days)	Body Weight [1] (BW) (kg)	Ingestion Rate of Groundwater [2] (IR-W) (L/day)	Skin Surface Area Available for Contact [3] (SA) (cm^2)	Age Group	Groundwater Ingestion CDI (L/kg-day)	Dermal CDI (cm^2-event/kg-day)	Ingestion CDI (L/kg-day)	Dermal CDI (cm^2-event/kg-day)
0	1	350	6.8	0.5	3,600	**0-<2 yrs Average**	**8.0E-04**	**6.8E+00**	1.0E-03	7.3E+00
1	1	350	11.4	0.5	5,300				6.0E-04	6.4E+00
2	1	350	13.5	0.5	6,020	**2-<6 yrs Average**	**4.1E-04**	**5.8E+00**	5.1E-04	6.1E+00
3	1	350	15.55	0.5	6,694				4.4E-04	5.9E+00
4	1	350	18.2	0.5	7,506				3.8E-04	5.6E+00
5	1	350	20.95	0.5	8,274				3.3E-04	5.4E+00
6	1	350	22.95	1	8,847	**6-<16 yrs Average**	**3.5E-04**	**4.3E+00**	6.0E-04	5.3E+00
7	1	350	26.55	1	9,775				5.2E-04	5.0E+00
8	1	350	32.3	1	11,043				4.2E-04	4.7E+00
9	1	350	35.7	1	11,840				3.8E-04	4.5E+00
10	1	350	39.3	1	12,623				3.5E-04	4.4E+00
11	1	350	45.8	1	13,963				3.0E-04	4.2E+00
12	1	350	51.2	1	15,010				2.7E-04	4.0E+00
13	1	350	55.8	1	15,865				2.5E-04	3.9E+00
14	1	350	61.9	1	16,980				2.2E-04	3.8E+00
15	1	350	64.7	1	17,492				2.1E-04	3.7E+00
16	1	350	68.7	1	18,000	**16-<30 yrs Average**	**1.9E-04**	**3.5E+00**	2.0E-04	3.6E+00
17	1	350	68.65	1	18,000				2.0E-04	3.6E+00
18	1	350	71.8	1	18,000				1.9E-04	3.4E+00
19	1	350	71.8	1	18,000				1.9E-04	3.4E+00
20	1	350	71.8	1	18,000				1.9E-04	3.4E+00
21	1	350	71.8	1	18,000				1.9E-04	3.4E+00
22	1	350	71.8	1	18,000				1.9E-04	3.4E+00
23	1	350	71.8	1	18,000				1.9E-04	3.4E+00
24	1	350	71.8	1	18,000				1.9E-04	3.4E+00
25	1	350	71.8	1	18,000				1.9E-04	3.4E+00
26	1	350	71.8	1	18,000				1.9E-04	3.4E+00
27	1	350	71.8	1	18,000				1.9E-04	3.4E+00
28	1	350	71.8	1	18,000				1.9E-04	3.4E+00
29	1	350	71.8	1	18,000				1.9E-04	3.4E+00

Equations: Chronic Daily Intake (CDI) (L/kg-day) =

Ingestion:
IR x EF x ED / (BW x AT)

Dermal:
SA x EV x EF x ED / (BW x AT)

where: AT = Averaging time - Cancer (days) = 25,550

Notes

[1] Body weights are mean values for males and females; for ages 0-1 and 2-17, respectively, from Tables 8-3 and 8-13 in Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 18-29, the recommended value for 18-75 years from Table 7-2 in Exposure Factors Handbook (USEPA, 1997b).

[2] Drinking water ingestion rate are based on professional judgment

[3] Total body surface areas for males and females; for ages 0-1, from Table 7-1 of Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 0-15, based on Equation 7A-3 in Appendix 7A of Child-Specific Exposure Factors Handbook (USEPA, 2008), and for ages 16-29, the default value for adults from Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) (USEPA, 2004).

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3

SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral Reference Dose (RfD)		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD : Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Benzene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Decreased lymphocyte count	300	IRIS	1/25/2011
	Subchronic	1.2E-02	mg/kg-day	1	1.2E-02	mg/kg-day	Decreased lymphocyte count	100	IRIS	1/25/2011
Bromodichloromethane	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Kidney effects	1,000	IRIS	1/25/2011
	Subchronic [1]	8.0E-03	mg/kg-day	1	8.0E-03	mg/kg-day	Developmental toxicity	100	NCEA	9/16/2009
Chlorobenzene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Histopathologic changes in liver	1,000	IRIS	1/25/2011
	Subchronic	7.0E-02	mg/kg-day	1	7.0E-02	mg/kg-day	Liver, kidney, gastrointestinal tract, and hematological effects	300	NCEA	10/12/2006
Chloroform	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Liver effects	100	IRIS	1/25/2011
	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Liver effects	100	ATSDR	12/1/2009
1,2-Dibromo-3-chloropropane	Chronic	2.0E-04	mg/kg-day	1	2.0E-04	mg/kg-day	NOAEL / Testicular effects	3,000	NCEA	8/3/2006
	Subchronic	2.0E-03	mg/kg-day	1	2.0E-03	mg/kg-day	NOAEL / Testicular effects	300	NCEA	8/3/2006
Dibromochloromethane	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Hepatic lesions	1,000	IRIS	1/25/2011
	Subchronic	7.0E-02	mg/kg-day	1	7.0E-02	mg/kg-day	Hepatic lesions	300	NCEA	9/30/2009
1,2-Dichlorobenzene	Chronic	9.0E-02	mg/kg-day	1	9.0E-02	mg/kg-day	No adverse effects observed	1,000	IRIS	1/25/2011
	Subchronic	6.0E-01	mg/kg-day	1	6.0E-01	mg/kg-day	Liver effects	100	ATSDR	12/1/2009
1,3-Dichlorobenzene	Chronic	N/A	--	--	N/A	--	--	--		
	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Endocrine effects	100	ATSDR	12/1/2009
1,4-Dichlorobenzene	Chronic	7.0E-02	mg/kg-day	1	7.0E-02	mg/kg-day	Liver effects	100	ATSDR	12/1/2009
	Subchronic	7.0E-02	mg/kg-day	1	7.0E-02	mg/kg-day	Liver effects	100	ATSDR	12/1/2009
1,1-Dichloroethane	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	NOAEL / Kidney damage and CNS suppression	3,000	NCEA	9/27/2006
	Subchronic	2.0E+00	mg/kg-day	1	2.0E+00	mg/kg-day	NOAEL / Kidney damage and CNS suppression	300	NCEA	9/27/2006
1,2-Dichloroethane	Chronic	N/A	--	1	N/A	--	--	--	NCEA	10/1/2010
	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Kidney effects	3,000	NCEA	10/1/2010
1,1-Dichloroethene	Chronic	5.0E-02	mg/kg-day	1	5.0E-02	mg/kg-day	Liver toxicity	100	IRIS	1/25/2011
cis-1,2-Dichloroethene	Chronic	2.0E-03	mg/kg-day	1	2.0E-03	mg/kg-day	Increased kidney weight	3,000	IRIS	1/25/2011
	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Increased kidney weight	300	IRIS	1/25/2011
trans-1,2-Dichloroethene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Red blood cell effects	3,000	IRIS	1/25/2011
	Subchronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	Red blood cell effects	300	IRIS	1/25/2011
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Liver and kidney toxicity	1,000	IRIS	1/25/2011
	Subchronic [1]	5.0E-02	mg/kg-day	1	5.0E-02	mg/kg-day	Liver effects	1,000	NCEA	9/10/2009
Methylcyclohexane	--	N/A	--	--	N/A	--	--	--		
Methyl tert-butyl ether	Chronic	N/A	--	--	N/A	--	--	--		
	Subchronic	3.0E-01	mg/kg-day	1	3.0E-01	mg/kg-day	Liver effects	300	ATSDR	12/1/2009
Methylene chloride	Chronic	6.0E-02	mg/kg-day	1	6.0E-02	mg/kg-day	Liver effects	100	IRIS	1/25/2011
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Liver toxicity	1,000	IRIS	1/25/2011
	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Liver toxicity	100	IRIS	1/25/2011

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral Reference Dose (RfD)		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD : Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,2-Trichloroethane	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Clinical serum chemistry	1,000	IRIS	1/25/2011
	Subchronic [1]	3.9E-03	mg/kg-day	1	3.9E-03	mg/kg-day	NOAEL / Liver toxicity	1,000	NCEA	10/17/2006
1,2,3-Trichlorobenzene	Chronic	N/A	--	--	N/A	--	--	--	NCEA	9/11/2009
	Subchronic	8.0E-03	mg/kg-day	1	8.0E-03	mg/kg-day	NOAEL / Reduced body weight gain, liver and thyroid effects	1,000	NCEA	9/11/2009
1,2,4-Trichlorobenzene	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Increased adrenal weights	1,000	IRIS	1/25/2011
	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Increased adrenal weights	100	IRIS	1/25/2011
Trichloroethene	--	N/A	--	--	N/A	--	--	--		
o-Xylene	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	Decreased body weight, increased mortality	1,000	IRIS	6/22/2011
	Subchronic	4.0E-01	mg/kg-day	1	4.0E-01	mg/kg-day	Decreased body weight	1,000	NCEA	4/4/2011
Vinyl chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Liver cell polymorphism	30	IRIS	1/25/2011
Benzo(a)anthracene	--	N/A	--	--	N/A	--	--	--		
Benzo(a)pyrene	--	N/A	--	--	N/A	--	--	--		
Benzo(b)fluoranthene	--	N/A	--	--	N/A	--	--	--		
Benzo(g,h,i)perylene	--	N/A	--	--	N/A	--	--	--		
Benzo(k)fluoranthene	--	N/A	--	--	N/A	--	--	--		
1,1-Biphenyl	Chronic	5.0E-02	mg/kg-day	1	5.0E-02	mg/kg-day	Kidney damage	1,000	IRIS	6/22/2011
	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	Developmental toxicity	100	NCEA	9/30/2009
bis(2-Ethylhexyl) phthalate	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Increased liver weight	1,000	IRIS	1/25/2011
	Subchronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	Increased liver weight	100	IRIS	1/25/2011
Dibenzo(a,h)anthracene	--	N/A	--	--	N/A	--	--	--		
Indeno(1,2,3-cd)pyrene	--	N/A	--	--	N/A	--	--	--		
Naphthalene	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Decreased mean body weight	3,000	IRIS	1/25/2011
	Subchronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	Decreased mean body weight	300	IRIS	1/25/2011
Phenanthrene	--	N/A	--	--	N/A	--	--	--		
Polychlorinated biphenyls, total (as Aroclor 1254)	Chronic	2.0E-05	mg/kg-day	1	2.0E-05	mg/kg-day	Eye effects; finger and toe nail effects; immunological effects	300	IRIS	1/25/2011
	Subchronic	6.0E-05	mg/kg-day	1	6.0E-05	mg/kg-day	Eye effects; finger and toe nail effects; immunological effects	100	IRIS	1/25/2011
2,3,7,8-TCDD	Chronic	1.0E-09	mg/kg-day	1	1E-09	mg/kg-day	Developmental effects	90	ATSDR	12/1/2009
	Subchronic	2.0E-08	mg/kg-day	1	2E-08	mg/kg-day	Lymphoreticular effects	30	ATSDR	12/1/2009
4,4'-DDD	--	N/A	--	--	N/A	--	--	--		
4,4'-DDE	--	N/A	--	--	N/A	--	--	--		
4,4'-DDT	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver lesions	100	IRIS	1/25/2011
	Subchronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver effects	100	ATSDR	12/1/2009
alpha-BHC	Chronic	8.0E-03	mg/kg-day	1	8.0E-03	mg/kg-day	Liver effects	100	ATSDR	12/1/2009
beta-BHC	Chronic	N/A	--	--	N/A	--	--	--		
	Subchronic	6.0E-04	mg/kg-day	1	6.0E-04	mg/kg-day	Liver effects	300	ATSDR	12/1/2009
delta-BHC	--	N/A	--	--	N/A	--	--	--		
gamma-BHC	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Liver and kidney toxicity	1,000	IRIS	1/25/2011
	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Liver and kidney toxicity	100	IRIS	1/25/2011

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral Reference Dose (RfD)		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD : Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
gamma-Chlordane	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver necrosis	300	IRIS	1/25/2011
Dieldrin	Chronic	5.0E-05	mg/kg-day	1	5.0E-05	mg/kg-day	Liver lesions	100	IRIS	1/25/2011
	Subchronic	1.0E-04	mg/kg-day	1	1.0E-04	mg/kg-day	Neurological effects	100	ATSDR	12/1/2009
Endosulfan II	Chronic	6.0E-03	mg/kg-day	1	6.0E-03	mg/kg-day	Reduced body weight gain, blood and kidney effects	100	IRIS	1/25/2011
Endosulfan sulfate	--	N/A	--	--	N/A	--	--	--		
Endrin aldehyde	--	N/A	--	--	N/A	--	--	--		
Heptachlor	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Increased liver weight	300	IRIS	1/25/2011
Aluminum	Chronic	1.0E+00	mg/kg-day	1	1.0E+00	mg/kg-day	Neurotoxicity	100	NCEA	10/23/2006
	Subchronic	1.0E+00	mg/kg-day	1	1.0E+00	mg/kg-day	Neurological effects	30	ATSDR	12/1/2009
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Longevity, blood glucose, and cholesterol	1,000	IRIS	1/25/2011
	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Longevity, blood glucose, and cholesterol	1,000	NCEA	7/29/2008
Arsenic	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Hyperpigmentation, keratosis	3	IRIS	1/25/2011
Barium	Chronic	2.0E-01	mg/kg-day	0.07	1.4E-02	mg/kg-day	Nephropathy	300	IRIS	1/25/2011
	Subchronic	2.0E-01	mg/kg-day	0.07	1.4E-02	mg/kg-day	Kidney effects	300	ATSDR	12/1/2009
Cadmium	Chronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Significant proteinuria	10	IRIS	1/25/2011
	Subchronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Musculoskeletal effects	100	ATSDR	12/1/2009
Chromium (as Cr VI)	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	None reported	900	IRIS	1/25/2011
	Subchronic	2.0E-02	mg/kg-day	0.025	5.0E-04	mg/kg-day	None reported	100	HEAST	7/1/1997
Cobalt	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Thyroid toxicity	1,000	NCEA	8/25/2008
	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Thyroid toxicity	300	NCEA	8/25/2008
Iron	Chronic	7.0E-01	mg/kg-day	1	7.0E-01	mg/kg-day	Gastrointestinal toxicity	1.5	NCEA	9/11/2006
	Subchronic	7.0E-01	mg/kg-day	1	7.0E-01	mg/kg-day	Gastrointestinal toxicity	1.5	NCEA	9/11/2006
Lead	--	N/A	--	--	N/A	--	--	--		
Manganese	Chronic	2.4E-02	mg/kg-day	0.04	9.6E-04	mg/kg-day	Central nervous system effects	1	IRIS	1/25/2011
Vanadium	Chronic	5.0E-03	mg/kg-day	0.026	1.3E-04	mg/kg-day	Decreased hair cysteine	100	IRIS [2]	1/25/2011

Notes
Gastrointestinal absorption efficiences are from Exhibit 4-1 in USEPA, 2004. See Section 4, "Toxicity Assessment," of the Human Health Risk Assessment text.
IRIS = Integrated Risk Information System (USEPA, 2011b)
NCEA = National Center for Environmental Assessment, Provisional Peer-Reviewed Toxicity Value
ATSDR = Agency for Toxic Substances and Disease Registry, Minimal Risk Level (ATSDR, 2009)

N/A = Not Available
NOAEL = No Observed Adverse Effect Level
[1] The subchronic RfD is from a different source than the chronic RfD. The subchronic value is lower than the chronic value and will therefore not be used in the noncancer hazard calculations.
[2] RfD is specific to vanadium pentoxide and was corrected for vanadium per the USEPA Regional Screening Levels User's Guide, Section 5.4 (USEPA, 2011c)

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation Reference Concentration (RfC)		Extrapolated Reference Dose (RfD)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Benzene	Chronic	3.0E-02	mg/m^3	NA	--	Decreased lymphocyte count	300	IRIS	1/25/2011
	Subchronic	9.0E-02	mg/m^3	NA	--	Decreased lymphocyte count	100	IRIS	1/25/2011
Bromodichloromethane	Chronic	N/A	--	NA	--	--	--	NCEA	9/16/2009
	Subchronic	2.0E-02	mg/m^3	NA	--	NOAEL / Kidney degeneration	300	NCEA	9/16/2009
Chlorobenzene	Chronic	5.0E-02	mg/m^3	NA	--	Kidney effects	1,000	NCEA	10/12/2006
	Subchronic	5.0E-01	mg/m^3	NA	--	Kidney effects	100	NCEA	10/12/2006
Chloroform	Chronic	9.8E-02	mg/m^3	NA	--	Liver effects	100	ATSDR	12/1/2009
	Subchronic	2.4E-01	mg/m^3	NA	--	Liver effects	300	ATSDR	12/1/2009
1,2-Dibromo-3-chloropropane	Chronic	2.0E-04	mg/m^3	NA	--	Testicular effects	1,000	IRIS	1/25/2011
	Subchronic	2.0E-03	mg/m^3	NA	--	Testicular effects	100	IRIS	1/25/2011
Dibromochloromethane	Chronic	N/A	--	NA	--	--	--	NCEA	9/30/2009
	Subchronic	N/A	--	NA	--	--	--	NCEA	9/30/2009
1,2-Dichlorobenzene	Chronic	2.0E-01	mg/m^3	NA	--	Decreased weight gain	1,000	HEAST	7/1/1997
	Subchronic	2.0E+00	mg/m^3	NA	--	Liver lesions	100	HEAST	7/1/1997
1,3-Dichlorobenzene	--	N/A	--	NA	--	--	--		
1,4-Dichlorobenzene	Chronic	8.0E-01	mg/m^3	NA	--	Increased liver weight	100	IRIS	1/25/2011
	Subchronic	2.4E+00	mg/m^3	NA	--	Increased liver weight	33	IRIS	1/25/2011
1,1-Dichloroethane	Chronic	N/A	--	NA	--	--	--	NCEA	9/27/2006
	Subchronic	N/A	--	NA	--	--	--	NCEA	9/27/2006
1,2-Dichloroethane	Chronic	7.0E-03	mg/m^3	NA	--	Neurobehavioral impairment	3,000	NCEA	10/1/2010
	Subchronic	7.0E-02	mg/m^3	NA	--	Neurobehavioral impairment	300	NCEA	10/1/2010
1,1-Dichloroethene	Chronic	2.0E-01	mg/m^3	NA	--	Liver toxicity	30	IRIS	1/25/2011
	Subchronic [1]	7.9E-02	mg/m^3	NA	--	Liver effects	100	ATSDR	12/1/2009
cis-1,2-Dichloroethene	Chronic	N/A	--	NA	--	--	--	NCEA	2/3/2011
	Subchronic	N/A	--	NA	--	--	--	NCEA	2/3/2011
trans-1,2-Dichloroethene	Chronic	6.0E-02	mg/m^3	NA	--	Liver and lung effects	3,000	NCEA	3/1/2006
	Subchronic	7.9E-01	mg/m^3	NA	--	Liver effects	1,000	ATSDR	12/1/2009
Ethylbenzene	Chronic	1.0E+00	mg/m^3	NA	--	Developmental toxicity	300	IRIS	1/25/2011
	Subchronic	9.0E+00	mg/m^3	NA	--	Ototoxicity (ear hair loss)	100	NCEA	9/10/2009
Methylcyclohexane	Chronic	3.0E+00	mg/m^3	NA	--	Kidney effects	100	HEAST	7/1/1997
	Subchronic	3.0E+00	mg/m^3	NA	--	Kidney effects	100	HEAST	7/1/1997
Methyl tert-butyl ether	Chronic	3.0E+00	mg/m^3	NA	--	Increased liver and kidney weight	100	IRIS	1/25/2011
	Subchronic [1]	2.5E+00	mg/m^3	NA	--	Neurological effects	100	ATSDR	12/1/2009
Methylene chloride	Chronic	1.0E+00	mg/m^3	NA	--	Liver effects	30	ATSDR	12/1/2009
	Subchronic	1.0E+00	mg/m^3	NA	--	Liver effects	90	ATSDR	12/1/2009
Tetrachloroethene	Chronic	2.7E-01	mg/m^3	NA	--	Neurological effects	100	ATSDR	12/1/2009
1,1,2-Trichloroethane	Chronic	N/A	--	NA	--	--	--	NCEA	7/5/2006
	Subchronic	N/A	--	NA	--	--	--	NCEA	7/5/2006
1,2,3-Trichlorobenzene	Chronic	N/A	--	NA	--	--	--	NCEA	9/11/2009
	Subchronic	N/A	--	NA	--	--	--	NCEA	9/11/2009

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation Reference Concentration (RfC)		Extrapolated Reference Dose (RfD)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,2,4-Trichlorobenzene	Chronic	2.0E-03	mg/m^3	NA	--	Blood effects (as evidenced by increased urinary excretion of porphyrins)	3,000	NCEA	6/16/2009
	Subchronic	2.0E-02	mg/m^3	NA	--	Blood effects (as evidenced by increased urinary excretion of porphyrins)	300	NCEA	6/16/2009
Trichloroethene	Chronic	N/A	--	NA	--	--	--		
	Subchronic	N/A	--	NA	--	--	--		
o-Xylene	Chronic	1.0E-01	mg/m^3	NA	--	Impaired motor coordination (decreased rotarod performance)	300	IRIS	6/22/2011
	Subchronic	4.0E-01	mg/m^3	NA	--	Impaired motor coordination	100	NCEA	9/30/2009
Vinyl chloride	Chronic	1.0E-01	mg/m^3	NA	--	Liver cell polymorphism	30	IRIS	1/25/2011
	Subchronic [1]	7.7E-02	mg/m^3	NA	--	Liver effects	30	ATSDR	12/1/2009
Benzo(a)anthracene	--	N/A	--	NA	--	--	--		
Benzo(a)pyrene	--	N/A	--	NA	--	--	--		
Benzo(b)fluoranthene	--	N/A	--	NA	--	--	--		
Benzo(g,h,i)perylene	--	N/A	--	NA	--	--	--		
Benzo(k)fluoranthene	--	N/A	--	NA	--	--	--		
1,1-Biphenyl	--	N/A	--	NA	--	--	--		
bis(2-Ethylhexyl) phthalate	--	N/A	--	NA	--	--	--		
Dibenzo(a,h)anthracene	--	N/A	--	NA	--	--	--		
Indeno(1,2,3-cd)pyrene	--	N/A	--	NA	--	--	--		
Naphthalene	Chronic	3.0E-03	mg/m^3	NA	--	Nasal effects	3,000	IRIS	1/25/2011
Phenanthrene	--	N/A	--	NA	--	--	--		
Polychlorinated biphenyls, total	--	N/A	--	NA	--	--	--		
2,3,7,8-TCDD	--	N/A	--	NA	--	--	--		
4,4'-DDD	--	N/A	--	NA	--	--	--		
4,4'-DDE	--	N/A	--	NA	--	--	--		
4,4'-DDT	--	N/A	--	NA	--	--	--		
alpha-BHC	--	N/A	--	NA	--	--	--		
beta-BHC	--	N/A	--	NA	--	--	--		
delta-BHC	--	N/A	--	NA	--	--	--		
gamma-BHC	--	N/A	--	NA	--	--	--		
gamma-Chlordane	Chronic	7.0E-04	mg/m^3	NA	--	Liver effects	1,000	IRIS	1/25/2011
	Subchronic	7.0E-03	mg/m^3	NA	--	Liver effects	100	IRIS	1/25/2011
Dieldrin	--	N/A	--	NA	--	--	--		
Endosulfan II	--	N/A	--	NA	--	--	--		
Endosulfan sulfate	--	N/A	--	NA	--	--	--		
Endrin aldehyde	--	N/A	--	NA	--	--	--		

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation Reference Concentration (RfC)		Extrapolated Reference Dose (RfD)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Heptachlor	--	N/A	--	NA	--	--	--		
Aluminum	Chronic	5.0E-03	mg/m^3	NA	--	Psychomotor and cognitive impairment	300	NCEA	10/23/2006
Antimony	Chronic	N/A	--	NA	--	--	--	NCEA	7/29/2008
	Subchronic	N/A	--	NA	--	--	--	NCEA	7/29/2008
Arsenic	Chronic	1.5E-05	mg/m^3	NA	--	Development, cardiovascular system, nervous system	--	CalEPA	2/1/2011
Barium	Chronic	5.0E-04	mg/m^3	NA	--	Fetotoxicity	1,000	HEAST	7/1/1997
	Subchronic	5.0E-03	mg/m^3	NA	--	Fetotoxicity	100	HEAST	7/1/1997
Cadmium	Chronic	1.0E-05	mg/m^3	NA	--	Kidney effects	9	ATSDR	12/1/2009
Chromium (as Cr VI)	Chronic	1.0E-04	mg/m^3	NA	--	Lung effects	300	IRIS	1/25/2011
	Subchronic	1.0E-03	mg/m^3	NA	--	Lung effects	30	IRIS	1/25/2011
Cobalt	Chronic	6.0E-06	mg/m^3	NA	--	Lung effects	300	NCEA	8/25/2008
	Subchronic	2.0E-05	mg/m^3	NA	--	Lung effects	100	NCEA	8/25/2008
Iron	--	N/A	--	NA	--	--	--		
Lead	--	N/A	--	NA	--	--	--		
Manganese	Chronic	5.0E-05	mg/m^3	NA	--	Neurologic effects	1,000	IRIS	1/25/2011
Vanadium	Chronic	N/A	mg/m^3	NA	--	--	--	NCEA	9/30/2009
	Subchronic	N/A	mg/m^3	NA	--	--	--	NCEA	9/30/2009

Notes
IRIS = Integrated Risk Information System (USEPA, 2011b)
NCEA = National Center for Environmental Assessment, Provisional Peer-Reviewed Toxicity Value
CalEPA = California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
ATSDR = Agency for Toxic Substances and Disease Registry, Minimal Risk Level (ATSDR, 2009)
HEAST = Health Effects Assessment Summary Tables (USEPA, 1997a)
[1] The subchronic RfC is from a different source than the chronic RfC. The subchronic value is lower than the chronic value and will therefore not be used in the noncancer hazard calculations.
N/A = Not Available
NA = Not Applicable

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor (CSF)		Oral Absorption Efficiency for Dermal	Absorbed Cancer Slope Factor for Dermal		USEPA Weight of Evidence Classification / Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Benzene	5.5E-02	$(mg/kg\text{-}day)^{-1}$	1	5.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	1/25/2011
Bromodichloromethane	6.2E-02	$(mg/kg\text{-}day)^{-1}$	1	6.2E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Chlorobenzene	N/A	--	--	N/A	--	D		
Chloroform	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1	3.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	CalEPA	2/1/2011
1,2-Dibromo-3-chloropropane	8.0E-01	$(mg/kg\text{-}day)^{-1}$	1	8.0E-01	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	NCEA	8/3/2006
Dibromochloromethane	8.4E-02	$(mg/kg\text{-}day)^{-1}$	1	8.4E-02	$(mg/kg\text{-}day)^{-1}$	C	IRIS	1/25/2011
1,2-Dichlorobenzene	N/A	--	--	N/A	--	D		
1,3-Dichlorobenzene	N/A	--	--	N/A	--	D		
1,4-Dichlorobenzene	5.4E-03	$(mg/kg\text{-}day)^{-1}$	1	5.4E-03	$(mg/kg\text{-}day)^{-1}$	--	CalEPA	2/1/2011
1,1-Dichloroethane	5.7E-03	$(mg/kg\text{-}day)^{-1}$	1	5.7E-03	$(mg/kg\text{-}day)^{-1}$	C	CalEPA	2/1/2011
1,2-Dichloroethane	9.1E-02	$(mg/kg\text{-}day)^{-1}$	1	9.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
1,1-Dichloroethene	N/A	--	--	N/A	--	C		
cis-1,2-Dichloroethene	N/A	--	--	N/A	--	Inadequate information	NCEA	2/3/2011
trans-1,2-Dichloroethene	N/A	--	--	N/A	--	--		
Ethylbenzene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	1	1.1E-02	$(mg/kg\text{-}day)^{-1}$	D	CalEPA	2/1/2011
Methylcyclohexane	N/A	--	--	N/A	--	--		
Methyl tert-butyl ether	1.8E-03	$(mg/kg\text{-}day)^{-1}$	1	1.8E-03	$(mg/kg\text{-}day)^{-1}$	--	CalEPA	2/1/2011
Methylene chloride	7.5E-03	$(mg/kg\text{-}day)^{-1}$	1	7.5E-03	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Tetrachloroethene	5.4E-01	$(mg/kg\text{-}day)^{-1}$	1	5.4E-01	$(mg/kg\text{-}day)^{-1}$	--	CalEPA	2/1/2011
1,1,2-Trichloroethane	5.7E-02	$(mg/kg\text{-}day)^{-1}$	1	5.7E-02	$(mg/kg\text{-}day)^{-1}$	C	IRIS	1/25/2011
1,2,3-Trichlorobenzene	N/A	--	--	N/A	--	Inadequate information	NCEA	9/11/2009
1,2,4-Trichlorobenzene	2.9E-02	$(mg/kg\text{-}day)^{-1}$	1	2.9E-02	$(mg/kg\text{-}day)^{-1}$	D	NCEA	6/16/2009
Trichloroethene	5.9E-03	$(mg/kg\text{-}day)^{-1}$	1	5.9E-03	$(mg/kg\text{-}day)^{-1}$	--	CalEPA	2/1/2011
o-Xylene	N/A	--	--	N/A	--	Data are inadequate		
Vinyl chloride (for adult workers)	7.2E-01	$(mg/kg\text{-}day)^{-1}$	1	7.2E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	1/25/2011
Vinyl chloride (for adult and child residents)	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1	1.5E+00	$(mg/kg\text{-}day)^{-1}$			
Benzo(a)anthracene	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Benzo(a)pyrene	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Benzo(b)fluoranthene	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Benzo(g,h,i)perylene	N/A	--	--	N/A	--	D	IRIS	1/25/2011
Benzo(k)fluoranthene	7.3E-02	$(mg/kg\text{-}day)^{-1}$	1	7.3E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
1,1-Biphenyl	N/A	--	--	N/A	--	D		
bis(2-Ethylhexyl) phthalate	1.4E-02	$(mg/kg\text{-}day)^{-1}$	1	1.4E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Dibenzo(a,h)anthracene	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Indeno(1,2,3-cd)pyrene	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Naphthalene	N/A	--	--	N/A	--	C		
Phenanthrene	N/A	--	--	N/A	--	D		
Polychlorinated biphenyls, total	4.0E-01	$(mg/kg\text{-}day)^{-1}$	1	4.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
2,3,7,8-TCDD	1.6E+05	$(mg/kg\text{-}day)^{-1}$	1	1.6E+05	$(mg/kg\text{-}day)^{-1}$	B2	USEPA, 1985	

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor (CSF)		Oral Absorption Efficiency for Dermal	Absorbed Cancer Slope Factor for Dermal		USEPA Weight of Evidence Classification / Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
4,4'-DDD	2.4E-01	$(mg/kg\text{-}day)^{-1}$	1	2.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
4,4'-DDE	3.4E-01	$(mg/kg\text{-}day)^{-1}$	1	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
4,4'-DDT	3.4E-01	$(mg/kg\text{-}day)^{-1}$	1	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
alpha-BHC (HCH)	6.3E+00	$(mg/kg\text{-}day)^{-1}$	1	6.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
beta-BHC	1.8E+00	$(mg/kg\text{-}day)^{-1}$	1	1.8E+00	$(mg/kg\text{-}day)^{-1}$	C	IRIS	1/25/2011
delta-BHC	N/A	--	--	N/A	--	D		
gamma-BHC (lindane)	1.1E+00	$(mg/kg\text{-}day)^{-1}$	1	1.1E+00	$(mg/kg\text{-}day)^{-1}$	--	CalEPA	2/1/2011
gamma-Chlordane	3.5E-01	$(mg/kg\text{-}day)^{-1}$	1	3.5E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Dieldrin	1.6E+01	$(mg/kg\text{-}day)^{-1}$	1	1.6E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Endosulfan II	N/A	--	--	N/A	--	--		
Endosulfan sulfate	N/A	--	--	N/A	--	--		
Endrin aldehyde	N/A	--	--	N/A	--	--		
Heptachlor	4.5E+00	$(mg/kg\text{-}day)^{-1}$	1	4.5E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/25/2011
Aluminum	N/A	--	--	N/A	--	Inadequate information	NCEA	10/23/2006
Antimony	N/A	--	--	N/A	--	Inadequate information	NCEA	8/5/2008
Arsenic	1.5E+00	(mg/kg-day)-1	1	1.5E+00	(mg/kg-day)-1	A	IRIS	1/25/2011
Barium	N/A	--	--	N/A	--	D		
Cadmium	N/A	--	--	N/A	--	B1		
Chromium (as Cr VI)	5.0E-01	(mg/kg-day)-1	0.025	2.0E+01	(mg/kg-day)-1	D	NJDEP	6/2009
Cobalt	N/A	--	--	N/A	--	--	NCEA	8/25/2008
Iron	N/A	--	--	N/A	--	--		
Lead	N/A	--	--	N/A	--	B2		
Manganese	N/A	--	--	N/A	--	D		
Vanadium	N/A	--	--	N/A	--	Inadequate information	NCEA	9/30/2009

Notes

Gastrointestinal absorption efficiences are from Exhibit 4-1 in USEPA, 2004. See Section 4, "Toxicity Assessment," of the Human Health Risk Assessment text.
IRIS = Integrated Risk Information System (USEPA, 2011b)
NCEA = National Center for Environmental Assessment, Provisional Peer-Reviewed Toxicity Value
CalEPA = California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
USEPA = United States Environmental Protection Agency, Office of Health and Environmental Assessment
NJDEP = New Jersey Department of Environmental Protection (Stern, 2009)
N/A = Not Available

USEPA (1986) Weight of Evidence Classifications:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

USEPA (2005b) Cancer Guidelines Descriptions:
Carcinogenic to humans
Likely to be carcinogenic to humans
Suggestive evidence of carcinogenic potential
Inadequate information to assess carcinogenic potential
Not likely to be carcinogenic to humans

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor (CSF)		USEPA Weight of Evidence Classification / Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source	Date (MM/DD/YYYY)
Benzene	7.8E-06	$(\mu g/m^3)^{-1}$	NA	--	A	IRIS	1/25/2011
Bromodichloromethane	3.7E-05	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Chlorobenzene	N/A	--	NA	--	D		
Chloroform	2.3E-05	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
1,2-Dibromo-3-chloropropane	6.0E-03	$(\mu g/m^3)^{-1}$	NA	--	Likely to be carcinogenic to humans	NCEA	8/3/2006
Dibromochloromethane	2.7E-05	$(\mu g/m^3)^{-1}$	NA	--	C	CalEPA	2/1/2011
1,2-Dichlorobenzene	N/A	--	NA	--	D		
1,3-Dichlorobenzene	N/A	--	NA	--	D		
1,4-Dichlorobenzene	1.1E-05	$(\mu g/m^3)^{-1}$	NA	--	--	CalEPA	2/1/2011
1,1-Dichloroethane	1.6E-06	$(\mu g/m^3)^{-1}$	NA	--	C	CalEPA	2/1/2011
1,2-Dichloroethane	2.6E-05	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
1,1-Dichloroethene	N/A	--	NA	--	C		
cis-1,2-Dichloroethene	N/A	--	NA	--	Inadequate information	NCEA	2/3/2011
trans-1,2-Dichloroethene	N/A	--	NA	--	--		
Ethylbenzene	2.5E-06	$(\mu g/m^3)^{-1}$	NA	--	D	CalEPA	2/1/2011
Methylcyclohexane	N/A	--	NA	--	--		
Methyl tert-butyl ether	2.6E-07	$(\mu g/m^3)^{-1}$	NA	--	--	CalEPA	2/1/2011
Methylene chloride	4.7E-07	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
Tetrachloroethene	5.9E-06	$(\mu g/m^3)^{-1}$	NA	--	--	CalEPA	2/1/2011
1,1,2-Trichloroethane	1.6E-05	$(\mu g/m^3)^{-1}$	NA	--	C	IRIS	1/25/2011
1,2,3-Trichlorobenzene	N/A	--	NA	--	Inadequate information	NCEA	9/11/2009
1,2,4-Trichlorobenzene	N/A	--	NA	--	D	NCEA	6/16/2009
Trichloroethene	2.0E-06	$(\mu g/m^3)^{-1}$	NA	--	--	CalEPA	2/1/2011
o-Xylene	N/A	--	NA	--	Data are inadequate		
Vinyl chloride (for adult workers)	4.4E-06	$(\mu g/m^3)^{-1}$	NA	--	A	IRIS	1/25/2011
Vinyl chloride (for adult and child residents)	8.8E-06	$(\mu g/m^3)^{-1}$	NA	--			

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor (CSF)		USEPA Weight of Evidence Classification / Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source	Date (MM/DD/YYYY)
Benzo(a)anthracene	1.1E-04	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Benzo(a)pyrene	1.1E-03	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Benzo(b)fluoranthene	1.1E-04	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Benzo(g,h,i)perylene	N/A	--	NA	--	D		
Benzo(k)fluoranthene	1.1E-04	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
1,1-Biphenyl	N/A	--	NA	--	D		
bis(2-Ethylhexyl) phthalate	2.4E-06	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Dibenzo(a,h)anthracene	1.2E-03	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Indeno(1,2,3-cd)pyrene	1.1E-04	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
Naphthalene	3.4E-05	$(\mu g/m^3)^{-1}$	NA	--	C	CalEPA	2/1/2011
Phenanthrene	N/A	--	NA	--	D		
Polychlorinated biphenyls, total	1.0E-04	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
2,3,7,8-TCDD	3.3E+01	$(\mu g/m^3)^{-1}$	NA	--	B2	HEAST	7/1997
4,4'-DDD	6.9E-05	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
4,4'-DDE	9.7E-05	$(\mu g/m^3)^{-1}$	NA	--	B2	CalEPA	2/1/2011
4,4'-DDT	9.7E-05	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
alpha-BHC (HCH)	1.8E-03	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
beta-BHC	5.3E-04	$(\mu g/m^3)^{-1}$	NA	--	C	IRIS	1/25/2011
delta-BHC	N/A	--	NA	--	D		
gamma-BHC (lindane)	3.1E-04	$(\mu g/m^3)^{-1}$	NA	--	--	CalEPA	2/1/2011
gamma-Chlordane	1.0E-04	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
Dieldrin	4.6E-03	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011
Endosulfan II	N/A	--	NA	--	--		
Endosulfan sulfate	N/A	--	NA	--	--		
Endrin aldehyde	N/A	--	NA	--	--		
Heptachlor	1.3E-03	$(\mu g/m^3)^{-1}$	NA	--	B2	IRIS	1/25/2011

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor (CSF)		USEPA Weight of Evidence Classification / Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source	Date (MM/DD/YYYY)
Aluminum	N/A	--	NA	--	Inadequate information	NCEA	10/23/2006
Antimony	N/A	--	NA	--	Inadequate information	NCEA	8/5/2008
Arsenic	4.3E-03	$(\mu g/m^3)^{-1}$	NA	--	A	IRIS	1/25/2011
Barium	N/A	--	NA	--	D		
Cadmium	1.8E-03	$(\mu g/m^3)^{-1}$	NA	--	B1	IRIS	1/25/2011
Chromium (as Cr VI)	1.2E-02	$(\mu g/m^3)^{-1}$	NA	--	A	IRIS	1/25/2011
Cobalt	9.0E-03	$(\mu g/m^3)^{-1}$	NA	--	Likely to be carcinogenic to humans by the inhalation route	NCEA	8/25/2008
Iron	N/A	--	NA	--	--		
Lead	N/A	--	NA	--	B2		
Manganese	N/A	--	NA	--	D		
Vanadium	N/A	--	NA	--	Inadequate information	NCEA	9/30/2009

Notes

IRIS = Integrated Risk Information System (USEPA, 2011b)
NCEA = National Center for Environmental Assessment, Provisional Peer-Reviewed Toxicity Value
CalEPA = California Environmental Protection Agency, Office of Environmental Health Hazard Assessment
N/A = Not Available

USEPA (1986) Weight of Evidence Classifications:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as to human carcinogenicity
E - Evidence of noncarcinogenicity

USEPA (2005b) Cancer Guidelines Descriptions:
Carcinogenic to humans
Likely to be carcinogenic to humans
Suggestive evidence of carcinogenic potential
Inadequate information to assess carcinogenic potential
Not likely to be carcinogenic to humans

TABLE 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Process Water	Dermal Absorption	Benzene	7.2E-04	mg/L	9.0E-07	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	5E-08	2.5E-06	mg/kg-day	4.0E-03	mg/kg-day	6E-04
				Bromodichloromethane	4.1E-04	mg/L	1.9E-07	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	1E-08	5.2E-07	mg/kg-day	2.0E-02	mg/kg-day	3E-05
				Chlorobenzene	3.7E-03	mg/L	8.8E-06	mg/kg-day	NA	--	--	2.5E-05	mg/kg-day	2.0E-02	mg/kg-day	1E-03
				Chloroform	2.8E-03	mg/L	1.7E-06	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	5E-08	4.8E-06	mg/kg-day	1.0E-02	mg/kg-day	5E-04
				Dibromochloromethane	3.4E-04	mg/L	1.3E-07	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	1E-08	3.6E-07	mg/kg-day	2.0E-02	mg/kg-day	2E-05
				1,2-Dichlorobenzene	2.1E-03	mg/L	7.8E-06	mg/kg-day	NA	--	--	2.2E-05	mg/kg-day	9.0E-02	mg/kg-day	2E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	2.5E-05	mg/kg-day	NA	--	--	7.1E-05	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	1.8E-05	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	1E-07	5.1E-05	mg/kg-day	7.0E-02	mg/kg-day	7E-04
				1,1-Dichloroethane	7.0E-04	mg/L	4.2E-07	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	2E-09	1.2E-06	mg/kg-day	2.0E-01	mg/kg-day	6E-06
				1,2-Dichloroethane	5.6E-04	mg/L	2.1E-07	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	2E-08	5.8E-07	mg/kg-day	NA	--	--
				1,1-Dichloroethene	5.7E-03	mg/L	5.8E-06	mg/kg-day	NA	--	--	1.6E-05	mg/kg-day	5.0E-02	mg/kg-day	3E-04
				cis-1,2-Dichloroethene	1.4E+01	mg/L	9.7E-03	mg/kg-day	NA	--	--	2.7E-02	mg/kg-day	2.0E-03	mg/kg-day	1E+01
				trans-1,2-Dichloroethene	6.1E-02	mg/L	4.2E-05	mg/kg-day	NA	--	--	1.2E-04	mg/kg-day	2.0E-02	mg/kg-day	6E-03
				Methyl tert-butyl ether	1.3E-02	mg/L	2.3E-06	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	4E-09	6.6E-06	mg/kg-day	NA	--	--
				Methylene chloride	5.0E-04	mg/L	1.6E-07	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	1E-09	4.4E-07	mg/kg-day	6.0E-02	mg/kg-day	7E-06
				Tetrachloroethene	3.6E-02	mg/L	1.1E-04	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	6E-05	3.1E-04	mg/kg-day	1.0E-02	mg/kg-day	3E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	5.7E-05	mg/kg-day	NA	--	--	1.6E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	3.6E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	1E-05	1.0E-03	mg/kg-day	1.0E-02	mg/kg-day	1E-01
				1,1,2-Trichloroethane	3.9E-03	mg/L	2.3E-06	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	1E-07	6.6E-06	mg/kg-day	4.0E-03	mg/kg-day	2E-03
				Trichloroethene	7.0E+00	mg/L	7.3E-03	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	4E-05	2.0E-02	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	2.6E-05	mg/kg-day	7.2E-01	(mg/kg-day)$^{-1}$	2E-05	7.3E-05	mg/kg-day	3.0E-03	mg/kg-day	2E-02
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	4.2E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	6E-07	1.2E-04	mg/kg-day	2.0E-02	mg/kg-day	6E-03
				Dibenzo(a,h)anthracene	1.7E-04	mg/L	2.7E-05	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2E-04	7.5E-05	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	1.4E-04	mg/L	1.6E-05	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	1E-05	4.4E-05	mg/kg-day	NA	--	--
				Naphthalene	3.4E-04	mg/L	1.3E-06	mg/kg-day	NA	--	--	3.7E-06	mg/kg-day	2.0E-02	mg/kg-day	2E-04
				Total PCB Aroclors	4.4E-03	mg/L	4.0E-04	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	2E-04	1.1E-03	mg/kg-day	2.0E-05	mg/kg-day	6E+01
				gamma-Chlordane	7.5E-04	mg/L	8.2E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	3E-06	2.3E-05	mg/kg-day	5.0E-04	mg/kg-day	5E-02
				4,4'-DDD	2.3E-04	mg/L	7.6E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	2E-06	2.1E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	7.9E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	3E-06	2.2E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	2.7E-05	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	9E-06	7.7E-05	mg/kg-day	5.0E-04	mg/kg-day	2E-01
				Heptachlor	3.6E-03	mg/L	8.2E-06	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	4E-05	2.3E-05	mg/kg-day	5.0E-04	mg/kg-day	5E-02
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	2.5E-09	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	4E-04	6.9E-09	mg/kg-day	1.0E-09	mg/kg-day	7E+00
				Aluminum	2.7E-01	mg/L	2.5E-05	mg/kg-day	NA	--	--	6.9E-05	mg/kg-day	1.0E+00	mg/kg-day	7E-05
				Arsenic	7.6E-02	mg/L	7.0E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1E-05	2.0E-05	mg/kg-day	3.0E-04	mg/kg-day	7E-02
				Barium	5.4E-01	mg/L	5.0E-05	mg/kg-day	NA	--	--	1.4E-04	mg/kg-day	1.4E-02	mg/kg-day	1E-02
				Cadmium	5.6E-04	mg/L	5.2E-08	mg/kg-day	NA	--	--	1.4E-07	mg/kg-day	2.5E-05	mg/kg-day	6E-03
				Chromium	2.3E-03	mg/L	4.2E-07	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	8E-06	1.2E-06	mg/kg-day	7.5E-05	mg/kg-day	2E-02
				Cobalt	4.2E-04	mg/L	1.5E-08	mg/kg-day	NA	--	--	4.3E-08	mg/kg-day	3.0E-04	mg/kg-day	1E-04
				Iron	5.4E-01	mg/L	5.0E-05	mg/kg-day	NA	--	--	1.4E-04	mg/kg-day	7.0E-01	mg/kg-day	2E-04
				Manganese	3.2E-01	mg/L	2.9E-05	mg/kg-day	NA	--	--	8.2E-05	mg/kg-day	9.6E-04	mg/kg-day	9E-02
				Vanadium	7.4E-03	mg/L	6.9E-07	mg/kg-day	NA	--	--	1.9E-06	mg/kg-day	1.3E-04	mg/kg-day	1E-02
			Exposure Route Total								1E-03					8E+01

TABLE 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Workplace Air	Inhalation	Benzene	1.6E+00	$\mu g/m^3$	1.3E-01	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	1E-06	3.6E-01	$\mu g/m^3$	3.0E+01	$\mu g/m^3$	1E-02
				Bromodichloromethane	8.8E-01	$\mu g/m^3$	7.2E-02	$\mu g/m^3$	3.7E-05	$(\mu g/m^3)^{-1}$	3E-06	2.0E-01	$\mu g/m^3$	NA	--	--
				Chlorobenzene	8.0E+00	$\mu g/m^3$	6.5E-01	$\mu g/m^3$	NA	--	--	1.8E+00	$\mu g/m^3$	5.0E+01	$\mu g/m^3$	4E-02
				Chloroform	6.0E+00	$\mu g/m^3$	4.9E-01	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	1E-05	1.4E+00	$\mu g/m^3$	9.8E+01	$\mu g/m^3$	1E-02
				Dibromochloromethane	7.4E-01	$\mu g/m^3$	6.1E-02	$\mu g/m^3$	2.7E-05	$(\mu g/m^3)^{-1}$	2E-06	1.7E-01	$\mu g/m^3$	NA	--	--
				1,2-Dichlorobenzene	4.6E+00	$\mu g/m^3$	3.8E-01	$\mu g/m^3$	NA	--	--	1.1E+00	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	5E-03
				1,3-Dichlorobenzene	1.1E+01	$\mu g/m^3$	9.2E-01	$\mu g/m^3$	NA	--	--	2.6E+00	$\mu g/m^3$	NA	--	--
				1,4-Dichlorobenzene	1.1E+01	$\mu g/m^3$	8.8E-01	$\mu g/m^3$	1.1E-05	$(\mu g/m^3)^{-1}$	1E-05	2.5E+00	$\mu g/m^3$	8.0E+02	$\mu g/m^3$	3E-03
				1,1-Dichloroethane	1.5E+00	$\mu g/m^3$	1.2E-01	$\mu g/m^3$	1.6E-06	$(\mu g/m^3)^{-1}$	2E-07	3.5E-01	$\mu g/m^3$	NA	--	--
				1,2-Dichloroethane	1.2E+00	$\mu g/m^3$	9.8E-02	$\mu g/m^3$	2.6E-05	$(\mu g/m^3)^{-1}$	3E-06	2.7E-01	$\mu g/m^3$	7.0E+00	$\mu g/m^3$	4E-02
				1,1-Dichloroethene	1.2E+01	$\mu g/m^3$	1.0E+00	$\mu g/m^3$	NA	--	--	2.8E+00	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	1E-02
				cis-1,2-Dichloroethene	3.1E+04	$\mu g/m^3$	2.5E+03	$\mu g/m^3$	NA	--	--	7.0E+03	$\mu g/m^3$	NA	--	--
				trans-1,2-Dichloroethene	1.3E+02	$\mu g/m^3$	1.1E+01	$\mu g/m^3$	NA	--	--	3.0E+01	$\mu g/m^3$	6.0E+01	$\mu g/m^3$	5E-01
				Methyl tert-butyl ether	2.7E+01	$\mu g/m^3$	2.2E+00	$\mu g/m^3$	2.6E-07	$(\mu g/m^3)^{-1}$	6E-07	6.2E+00	$\mu g/m^3$	3.0E+03	$\mu g/m^3$	2E-03
				Methylene chloride	1.1E+00	$\mu g/m^3$	8.9E-02	$\mu g/m^3$	4.7E-07	$(\mu g/m^3)^{-1}$	4E-08	2.5E-01	$\mu g/m^3$	1.0E+03	$\mu g/m^3$	2E-04
				Tetrachloroethene	7.8E+01	$\mu g/m^3$	6.4E+00	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	4E-05	1.8E+01	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	7E-02
				1,2,3-Trichlorobenzene	1.8E+01	$\mu g/m^3$	1.5E+00	$\mu g/m^3$	NA	--	--	4.2E+00	$\mu g/m^3$	NA	--	--
				1,2,4-Trichlorobenzene	1.3E+02	$\mu g/m^3$	1.0E+01	$\mu g/m^3$	NA	--	--	2.9E+01	$\mu g/m^3$	2.0E+00	$\mu g/m^3$	1E+01
				1,1,2-Trichloroethane	8.4E+00	$\mu g/m^3$	6.9E-01	$\mu g/m^3$	1.6E-05	$(\mu g/m^3)^{-1}$	1E-05	1.9E+00	$\mu g/m^3$	NA	--	--
				Trichloroethene	1.5E+04	$\mu g/m^3$	1.2E+03	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	2E-03	3.5E+03	$\mu g/m^3$	NA	--	--
				Vinyl chloride	1.2E+02	$\mu g/m^3$	9.4E+00	$\mu g/m^3$	4.4E-06	$(\mu g/m^3)^{-1}$	4E-05	2.6E+01	$\mu g/m^3$	1.0E+02	$\mu g/m^3$	3E-01
				Naphthalene	7.4E-01	$\mu g/m^3$	6.0E-02	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	2E-06	1.7E-01	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	6E-02
			Exposure Route Total								3E-03					2E+01
		Exposure Point Total									4E-03					9E+01
	Total of Receptor Risks Across Medium										4E-03					9E+01

Notes
NA - Not Available

TABLE 7.1.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Process Water	Dermal Absorption	Benzene	7.2E-04	mg/L	1.0E-07	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	6E-09	1.1E-06	mg/kg-day	4.0E-03	mg/kg-day	3E-04
				Bromodichloromethane	4.1E-04	mg/L	2.2E-08	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	1E-09	2.3E-07	mg/kg-day	2.0E-02	mg/kg-day	1E-05
				Chlorobenzene	3.7E-03	mg/L	1.0E-06	mg/kg-day	NA	--	--	1.1E-05	mg/kg-day	2.0E-02	mg/kg-day	5E-04
				Chloroform	2.8E-03	mg/L	2.0E-07	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	6E-09	2.1E-06	mg/kg-day	1.0E-02	mg/kg-day	2E-04
				Dibromochloromethane	3.4E-04	mg/L	1.5E-08	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	1E-09	1.6E-07	mg/kg-day	2.0E-02	mg/kg-day	8E-06
				1,2-Dichlorobenzene	2.1E-03	mg/L	9.1E-07	mg/kg-day	NA	--	--	9.7E-06	mg/kg-day	9.0E-02	mg/kg-day	1E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	3.0E-06	mg/kg-day	NA	--	--	3.2E-05	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	2.1E-06	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	1E-08	2.3E-05	mg/kg-day	7.0E-02	mg/kg-day	3E-04
				1,1-Dichloroethane	7.0E-04	mg/L	4.8E-08	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	3E-10	5.1E-07	mg/kg-day	2.0E-01	mg/kg-day	3E-06
				1,2-Dichloroethane	5.6E-04	mg/L	2.4E-08	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	2E-09	2.5E-07	mg/kg-day	NA	--	--
				1,1-Dichloroethene	5.7E-03	mg/L	6.6E-07	mg/kg-day	NA	--	--	7.0E-06	mg/kg-day	5.0E-02	mg/kg-day	1E-04
				cis-1,2-Dichloroethene	1.4E+01	mg/L	1.1E-03	mg/kg-day	NA	--	--	1.2E-02	mg/kg-day	2.0E-03	mg/kg-day	6E+00
				trans-1,2-Dichloroethene	6.1E-02	mg/L	4.7E-06	mg/kg-day	NA	--	--	5.0E-05	mg/kg-day	2.0E-02	mg/kg-day	3E-03
				Methyl tert-butyl ether	1.3E-02	mg/L	2.7E-07	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	5E-10	2.8E-06	mg/kg-day	NA	--	--
				Methylene chloride	5.0E-04	mg/L	1.8E-08	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	1E-10	1.9E-07	mg/kg-day	6.0E-02	mg/kg-day	3E-06
				Tetrachloroethene	3.6E-02	mg/L	1.3E-05	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	7E-06	1.4E-04	mg/kg-day	1.0E-02	mg/kg-day	1E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	7.0E-06	mg/kg-day	NA	--	--	7.4E-05	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	4.4E-05	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	1E-06	4.6E-04	mg/kg-day	1.0E-02	mg/kg-day	5E-02
				1,1,2-Trichloroethane	3.9E-03	mg/L	2.7E-07	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	2E-08	2.8E-06	mg/kg-day	4.0E-03	mg/kg-day	7E-04
				Trichloroethene	7.0E+00	mg/L	8.7E-04	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	5E-06	9.2E-03	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	2.9E-06	mg/kg-day	7.2E-01	(mg/kg-day)$^{-1}$	2E-06	3.1E-05	mg/kg-day	3.0E-03	mg/kg-day	1E-02
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	9.6E-06	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	1E-07	1.0E-04	mg/kg-day	2.0E-02	mg/kg-day	5E-03
				Dibenzo(a,h)anthracene	1.7E-04	mg/L	6.0E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	4E-05	6.4E-05	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	1.4E-04	mg/L	3.6E-06	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3E-06	3.8E-05	mg/kg-day	NA	--	--
				Naphthalene	3.4E-04	mg/L	1.5E-07	mg/kg-day	NA	--	--	1.6E-06	mg/kg-day	2.0E-02	mg/kg-day	8E-05
				Total PCB Aroclors	4.4E-03	mg/L	9.3E-05	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	4E-05	9.8E-04	mg/kg-day	2.0E-05	mg/kg-day	5E+01
				gamma-Chlordane	7.5E-04	mg/L	1.9E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	7E-07	2.0E-05	mg/kg-day	5.0E-04	mg/kg-day	4E-02
				4,4'-DDD	2.3E-04	mg/L	1.7E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	4E-07	1.8E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	1.8E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	6E-07	1.9E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	6.2E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-06	6.5E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				Heptachlor	3.6E-03	mg/L	1.8E-06	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	8E-06	2.0E-05	mg/kg-day	5.0E-04	mg/kg-day	4E-02
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	5.6E-10	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	9E-05	6.0E-09	mg/kg-day	1.0E-09	mg/kg-day	6E+00
				Aluminum	2.7E-01	mg/L	4.9E-06	mg/kg-day	NA	--	--	5.2E-05	mg/kg-day	1.0E+00	mg/kg-day	5E-05
				Arsenic	7.6E-02	mg/L	1.4E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-06	1.5E-05	mg/kg-day	3.0E-04	mg/kg-day	5E-02
				Barium	5.4E-01	mg/L	9.9E-06	mg/kg-day	NA	--	--	1.1E-04	mg/kg-day	1.4E-02	mg/kg-day	8E-03
				Cadmium	5.6E-04	mg/L	1.0E-08	mg/kg-day	NA	--	--	1.1E-07	mg/kg-day	2.5E-05	mg/kg-day	4E-03
				Chromium	2.3E-03	mg/L	8.3E-08	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	2E-06	8.8E-07	mg/kg-day	7.5E-05	mg/kg-day	1E-02
				Cobalt	4.2E-04	mg/L	3.1E-09	mg/kg-day	NA	--	--	3.2E-08	mg/kg-day	3.0E-04	mg/kg-day	1E-04
				Iron	5.4E-01	mg/L	9.8E-06	mg/kg-day	NA	--	--	1.0E-04	mg/kg-day	7.0E-01	mg/kg-day	1E-04
				Manganese	3.2E-01	mg/L	5.8E-06	mg/kg-day	NA	--	--	6.2E-05	mg/kg-day	9.6E-04	mg/kg-day	6E-02
				Vanadium	7.4E-03	mg/L	1.4E-07	mg/kg-day	NA	--	--	1.4E-06	mg/kg-day	1.3E-04	mg/kg-day	1E-02
			Exposure Route Total								2E-04					6E+01

TABLE 7.1.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Workplace Air	Inhalation	Benzene	1.2E+00	μg/m^3	1.9E-02	μg/m^3	7.8E-06	(μg/m^3)$^{-1}$	1E-07	2.0E-01	μg/m^3	3.0E+01	μg/m^3	7E-03
				Bromodichloromethane	6.6E-01	μg/m^3	1.1E-02	μg/m^3	3.7E-05	(μg/m^3)$^{-1}$	4E-07	1.1E-01	μg/m^3	NA	--	--
				Chlorobenzene	6.0E+00	μg/m^3	9.7E-02	μg/m^3	NA	--	--	1.0E+00	μg/m^3	5.0E+01	μg/m^3	2E-02
				Chloroform	4.5E+00	μg/m^3	7.3E-02	μg/m^3	2.3E-05	(μg/m^3)$^{-1}$	2E-06	7.7E-01	μg/m^3	9.8E+01	μg/m^3	8E-03
				Dibromochloromethane	5.6E-01	μg/m^3	9.0E-03	μg/m^3	2.7E-05	(μg/m^3)$^{-1}$	2E-07	9.5E-02	μg/m^3	NA	--	--
				1,2-Dichlorobenzene	3.5E+00	μg/m^3	5.6E-02	μg/m^3	NA	--	--	6.0E-01	μg/m^3	2.0E+02	μg/m^3	3E-03
				1,3-Dichlorobenzene	8.5E+00	μg/m^3	1.4E-01	μg/m^3	NA	--	--	1.5E+00	μg/m^3	NA	--	--
				1,4-Dichlorobenzene	8.1E+00	μg/m^3	1.3E-01	μg/m^3	1.1E-05	(μg/m^3)$^{-1}$	1E-06	1.4E+00	μg/m^3	8.0E+02	μg/m^3	2E-03
				1,1-Dichloroethane	1.1E+00	μg/m^3	1.8E-02	μg/m^3	1.6E-06	(μg/m^3)$^{-1}$	3E-08	1.9E-01	μg/m^3	NA	--	--
				1,2-Dichloroethane	9.0E-01	μg/m^3	1.5E-02	μg/m^3	2.6E-05	(μg/m^3)$^{-1}$	4E-07	1.5E-01	μg/m^3	7.0E+00	μg/m^3	2E-02
				1,1-Dichloroethene	9.3E+00	μg/m^3	1.5E-01	μg/m^3	NA	--	--	1.6E+00	μg/m^3	2.0E+02	μg/m^3	8E-03
				cis-1,2-Dichloroethene	2.3E+04	μg/m^3	3.7E+02	μg/m^3	NA	--	--	3.9E+03	μg/m^3	NA	--	--
				trans-1,2-Dichloroethene	9.9E+01	μg/m^3	1.6E+00	μg/m^3	NA	--	--	1.7E+01	μg/m^3	6.0E+01	μg/m^3	3E-01
				Methyl tert-butyl ether	2.0E+01	μg/m^3	3.3E-01	μg/m^3	2.6E-07	(μg/m^3)$^{-1}$	9E-08	3.5E+00	μg/m^3	3.0E+03	μg/m^3	1E-03
				Methylene chloride	8.2E-01	μg/m^3	1.3E-02	μg/m^3	4.7E-07	(μg/m^3)$^{-1}$	6E-09	1.4E-01	μg/m^3	1.0E+03	μg/m^3	1E-04
				Tetrachloroethene	5.8E+01	μg/m^3	9.4E-01	μg/m^3	5.9E-06	(μg/m^3)$^{-1}$	6E-06	1.0E+01	μg/m^3	2.7E+02	μg/m^3	4E-02
				1,2,3-Trichlorobenzene	1.4E+01	μg/m^3	2.2E-01	μg/m^3	NA	--	--	2.4E+00	μg/m^3	NA	--	--
				1,2,4-Trichlorobenzene	9.5E+01	μg/m^3	1.5E+00	μg/m^3	NA	--	--	1.6E+01	μg/m^3	2.0E+00	μg/m^3	8E+00
				1,1,2-Trichloroethane	6.3E+00	μg/m^3	1.0E-01	μg/m^3	1.6E-05	(μg/m^3)$^{-1}$	2E-06	1.1E+00	μg/m^3	NA	--	--
				Trichloroethene	1.1E+04	μg/m^3	1.8E+02	μg/m^3	2.0E-06	(μg/m^3)$^{-1}$	4E-04	2.0E+03	μg/m^3	NA	--	--
				Vinyl chloride	8.6E+01	μg/m^3	1.4E+00	μg/m^3	4.4E-06	(μg/m^3)$^{-1}$	6E-06	1.5E+01	μg/m^3	1.0E+02	μg/m^3	1E-01
				Naphthalene	5.5E-01	μg/m^3	8.9E-03	μg/m^3	3.4E-05	(μg/m^3)$^{-1}$	3E-07	9.5E-02	μg/m^3	3.0E+00	μg/m^3	3E-02
			Exposure Route Total								4E-04					9E+00
		Exposure Point Total									6E-04					7E+01
	Total of Receptor Risks Across Medium										6E-04					7E+01

Notes
NA - Not Available

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Onsite Groundwater	Top of the Groundwater Table	Dermal Absorption	Benzene	3.0E-03	mg/L	4.0E-08	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	2E-09	1.2E-05	mg/kg-day	1.2E-02	mg/kg-day	1E-03
				Chlorobenzene	1.7E-02	mg/L	4.3E-07	mg/kg-day	NA	--	--	1.3E-04	mg/kg-day	7.0E-02	mg/kg-day	2E-03
				Chloroform	2.8E-03	mg/L	1.9E-08	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	6E-10	5.9E-06	mg/kg-day	1.0E-01	mg/kg-day	6E-05
				1,2-Dibromo-3-chloropropane	7.7E-05	mg/L	7.3E-10	mg/kg-day	8.0E-01	(mg/kg-day)$^{-1}$	6E-10	2.3E-07	mg/kg-day	2.0E-03	mg/kg-day	1E-04
				Dibromochloromethane	5.5E-04	mg/L	2.2E-09	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	2E-10	6.8E-07	mg/kg-day	7.0E-02	mg/kg-day	1E-05
				1,2-Dichlorobenzene	7.2E-03	mg/L	2.8E-07	mg/kg-day	NA	--	--	8.7E-05	mg/kg-day	6.0E-01	mg/kg-day	1E-04
				1,3-Dichlorobenzene	1.4E-02	mg/L	7.3E-07	mg/kg-day	NA	--	--	2.3E-04	mg/kg-day	2.0E-02	mg/kg-day	1E-02
				1,4-Dichlorobenzene	1.9E-02	mg/L	7.4E-07	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	4E-09	2.3E-04	mg/kg-day	7.0E-02	mg/kg-day	3E-03
				1,1-Dichloroethane	2.9E-03	mg/L	1.9E-08	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	1E-10	5.8E-06	mg/kg-day	2.0E+00	mg/kg-day	3E-06
				1,2-Dichloroethane	4.6E-03	mg/L	1.8E-08	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	2E-09	5.7E-06	mg/kg-day	2.0E-02	mg/kg-day	3E-04
				1,1-Dichloroethene	6.8E-02	mg/L	7.4E-07	mg/kg-day	NA	--	--	2.3E-04	mg/kg-day	5.0E-02	mg/kg-day	5E-03
				cis-1,2-Dichloroethene	1.4E+02	mg/L	1.0E-03	mg/kg-day	NA	--	--	3.2E-01	mg/kg-day	2.0E-02	mg/kg-day	2E+01
				trans-1,2-Dichloroethene	5.8E-01	mg/L	4.2E-06	mg/kg-day	NA	--	--	1.3E-03	mg/kg-day	2.0E-01	mg/kg-day	7E-03
				Ethylbenzene	1.1E-02	mg/L	4.6E-07	mg/kg-day	1.1E-02	(mg/kg-day)$^{-1}$	5E-09	1.4E-04	mg/kg-day	1.0E-01	mg/kg-day	1E-03
				Methylcyclohexane	5.9E-03	mg/L	4.8E-07	mg/kg-day	NA	--	--	1.5E-04	mg/kg-day	NA	--	--
				Methylene chloride	7.0E-03	mg/L	2.3E-08	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	2E-10	7.2E-06	mg/kg-day	6.0E-02	mg/kg-day	1E-04
				Tetrachloroethene	5.4E-01	mg/L	1.8E-05	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	1E-05	5.5E-03	mg/kg-day	1.0E-01	mg/kg-day	6E-02
				1,2,3-Trichlorobenzene	7.4E-02	mg/L	5.3E-06	mg/kg-day	NA	--	--	1.7E-03	mg/kg-day	8.0E-03	mg/kg-day	2E-01
				1,2,4-Trichlorobenzene	1.8E-01	mg/L	1.2E-05	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	3E-07	3.6E-03	mg/kg-day	1.0E-01	mg/kg-day	4E-02
				1,1,2-Trichloroethane	1.4E-02	mg/L	8.8E-08	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	5E-09	2.8E-05	mg/kg-day	4.0E-03	mg/kg-day	7E-03
				Trichloroethene	2.3E+01	mg/L	2.6E-04	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	2E-06	8.0E-02	mg/kg-day	NA	--	--
				o-Xylene	3.8E-02	mg/L	1.5E-06	mg/kg-day	NA	--	--	4.8E-04	mg/kg-day	4.0E-01	mg/kg-day	1E-03
				Vinyl chloride	1.6E-01	mg/L	8.2E-07	mg/kg-day	7.2E-01	(mg/kg-day)$^{-1}$	6E-07	2.6E-04	mg/kg-day	3.0E-03	mg/kg-day	9E-02
				Benzo(a)anthracene	6.1E-04	mg/L	3.6E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3E-07	1.1E-04	mg/kg-day	NA	--	--
				Benzo(a)pyrene	3.5E-04	mg/L	3.5E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	3E-06	1.1E-04	mg/kg-day	NA	--	--
				Benzo(b)fluoranthene	2.1E-03	mg/L	2.1E-06	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	2E-06	6.6E-04	mg/kg-day	NA	--	--
				Benzo(g,h,i)perylene	3.7E-04	mg/L	7.0E-07	mg/kg-day	NA	--	--	2.2E-04	mg/kg-day	NA	--	--
				Benzo(k)fluoranthene	7.2E-04	mg/L	7.2E-07	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	5E-08	2.2E-04	mg/kg-day	NA	--	--
				1,1-Biphenyl	2.7E-03	mg/L	2.2E-07	mg/kg-day	NA	--	--	6.8E-05	mg/kg-day	1.0E-01	mg/kg-day	7E-04
				Dibenzo(a,h)anthracene	1.4E-03	mg/L	2.1E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2E-05	6.5E-04	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	3.8E-04	mg/L	4.0E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3E-07	1.2E-04	mg/kg-day	NA	--	--
				Naphthalene	2.0E-03	mg/L	8.2E-08	mg/kg-day	NA	--	--	2.6E-05	mg/kg-day	2.0E-01	mg/kg-day	1E-04
				Phenanthrene	5.2E-04	mg/L	6.9E-08	mg/kg-day	NA	--	--	2.2E-05	mg/kg-day	NA	--	--
				Total PCB Aroclors	1.2E-02	mg/L	1.0E-05	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	4E-06	3.2E-03	mg/kg-day	6.0E-05	mg/kg-day	5E+01
				alpha-BHC	4.9E-04	mg/L	9.7E-09	mg/kg-day	6.3E+00	(mg/kg-day)$^{-1}$	6E-08	3.0E-06	mg/kg-day	8.0E-03	mg/kg-day	4E-04
				delta-BHC	1.4E-03	mg/L	4.7E-08	mg/kg-day	NA	--	--	1.5E-05	mg/kg-day	NA	--	--
				gamma-BHC	2.0E-04	mg/L	3.6E-09	mg/kg-day	1.1E+00	(mg/kg-day)$^{-1}$	4E-09	1.1E-06	mg/kg-day	3.0E-03	mg/kg-day	4E-04
				gamma-Chlordane	2.2E-03	mg/L	2.3E-07	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	8E-08	7.0E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				4,4'-DDD	5.9E-04	mg/L	1.9E-07	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	5E-08	5.9E-05	mg/kg-day	NA	--	--
				4,4'-DDE	1.3E-03	mg/L	3.7E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	1E-07	1.2E-04	mg/kg-day	NA	--	--
				4,4'-DDT	2.0E-03	mg/L	1.1E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	4E-07	3.4E-04	mg/kg-day	5.0E-04	mg/kg-day	7E-01
				Dieldrin	4.7E-04	mg/L	1.5E-08	mg/kg-day	1.6E+01	(mg/kg-day)$^{-1}$	2E-07	4.7E-06	mg/kg-day	1.0E-04	mg/kg-day	5E-02
				Endosulfan II	1.1E-03	mg/L	1.3E-08	mg/kg-day	NA	--	--	3.9E-06	mg/kg-day	6.0E-03	mg/kg-day	7E-04
				Endosulfan sulfate	4.5E-04	mg/L	3.5E-09	mg/kg-day	NA	--	--	1.1E-06	mg/kg-day	NA	--	--
				Endrin aldehyde	7.7E-04	mg/L	4.5E-08	mg/kg-day	NA	--	--	1.4E-05	mg/kg-day	NA	--	--
				Heptachlor	8.7E-04	mg/L	1.9E-08	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	9E-08	6.0E-06	mg/kg-day	5.0E-04	mg/kg-day	1E-02
				2,3,7,8-TCDD Toxic Equivalence	5.4E-08	mg/L	4.9E-11	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	8E-06	1.5E-08	mg/kg-day	2.0E-08	mg/kg-day	8E-01
				Aluminum	1.8E+00	mg/L	1.6E-06	mg/kg-day	NA	--	--	5.1E-04	mg/kg-day	1.0E+00	mg/kg-day	5E-04
				Arsenic	1.4E-01	mg/L	1.2E-07	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-07	3.9E-05	mg/kg-day	3.0E-04	mg/kg-day	1E-01
				Barium	8.2E-01	mg/L	7.3E-07	mg/kg-day	NA	--	--	2.3E-04	mg/kg-day	1.4E-02	mg/kg-day	2E-02
				Cadmium	3.3E-03	mg/L	3.0E-09	mg/kg-day	NA	--	--	9.2E-07	mg/kg-day	2.5E-05	mg/kg-day	4E-02
				Chromium	2.9E-02	mg/L	5.1E-08	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	1E-06	1.6E-05	mg/kg-day	5.0E-04	mg/kg-day	3E-02
				Cobalt	9.3E-04	mg/L	3.3E-10	mg/kg-day	NA	--	--	1.0E-07	mg/kg-day	3.0E-03	mg/kg-day	3E-05
				Iron	2.7E+00	mg/L	2.4E-06	mg/kg-day	NA	--	--	7.5E-04	mg/kg-day	7.0E-01	mg/kg-day	1E-03
				Manganese	6.7E-01	mg/L	5.9E-07	mg/kg-day	NA	--	--	1.8E-04	mg/kg-day	9.6E-04	mg/kg-day	2E-01
				Vanadium	7.8E-03	mg/L	6.9E-09	mg/kg-day	NA	--	--	2.2E-06	mg/kg-day	1.3E-04	mg/kg-day	2E-02
			Exposure Route Total								5E-05					7E+01

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Onsite Groundwater	Outdoor Air Around an Excavation	Inhalation	Benzene	4.7E-03	$\mu g/m^3$	3.7E-06	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	3E-11	1.1E-03	$\mu g/m^3$	9.0E+01	$\mu g/m^3$	1E-05
				Chlorobenzene	1.9E-02	$\mu g/m^3$	1.5E-05	$\mu g/m^3$	NA	--	--	4.6E-03	$\mu g/m^3$	5.0E+02	$\mu g/m^3$	9E-06
				Chloroform	3.6E-03	$\mu g/m^3$	2.8E-06	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	6E-11	8.8E-04	$\mu g/m^3$	2.4E+02	$\mu g/m^3$	4E-06
				1,2-Dibromo-3-chloropropane	5.3E-05	$\mu g/m^3$	4.1E-08	$\mu g/m^3$	6.0E-03	$(\mu g/m^3)^{-1}$	2E-10	1.3E-05	$\mu g/m^3$	2.0E+00	$\mu g/m^3$	6E-06
				Dibromochloromethane	5.0E-04	$\mu g/m^3$	3.9E-07	$\mu g/m^3$	2.7E-05	$(\mu g/m^3)^{-1}$	1E-11	1.2E-04	$\mu g/m^3$	NA	--	--
				1,2-Dichlorobenzene	8.1E-03	$\mu g/m^3$	6.3E-06	$\mu g/m^3$	NA	--	--	2.0E-03	$\mu g/m^3$	2.0E+03	$\mu g/m^3$	1E-06
				1,3-Dichlorobenzene	1.6E-02	$\mu g/m^3$	1.2E-05	$\mu g/m^3$	NA	--	--	3.9E-03	$\mu g/m^3$	NA	--	--
				1,4-Dichlorobenzene	2.2E-02	$\mu g/m^3$	1.7E-05	$\mu g/m^3$	1.1E-05	$(\mu g/m^3)^{-1}$	2E-10	5.2E-03	$\mu g/m^3$	2.4E+03	$\mu g/m^3$	2E-06
				1,1-Dichloroethane	4.1E-03	$\mu g/m^3$	3.2E-06	$\mu g/m^3$	1.6E-06	$(\mu g/m^3)^{-1}$	5E-12	9.9E-04	$\mu g/m^3$	NA	--	--
				1,2-Dichloroethane	6.1E-03	$\mu g/m^3$	4.8E-06	$\mu g/m^3$	2.6E-05	$(\mu g/m^3)^{-1}$	1E-10	1.5E-03	$\mu g/m^3$	7.0E+01	$\mu g/m^3$	2E-05
				1,1-Dichloroethene	9.7E-02	$\mu g/m^3$	7.6E-05	$\mu g/m^3$	NA	--	--	2.4E-02	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	1E-04
				cis-1,2-Dichloroethene	2.0E+02	$\mu g/m^3$	1.5E-01	$\mu g/m^3$	NA	--	--	4.8E+01	$\mu g/m^3$	NA	--	--
				trans-1,2-Dichloroethene	8.2E-01	$\mu g/m^3$	6.4E-04	$\mu g/m^3$	NA	--	--	2.0E-01	$\mu g/m^3$	7.9E+02	$\mu g/m^3$	3E-04
				Ethylbenzene	1.5E-02	$\mu g/m^3$	1.2E-05	$\mu g/m^3$	2.5E-06	$(\mu g/m^3)^{-1}$	3E-11	3.6E-03	$\mu g/m^3$	9.0E+03	$\mu g/m^3$	4E-07
				Methylcyclohexane	8.3E-03	$\mu g/m^3$	6.5E-06	$\mu g/m^3$	NA	--	--	2.0E-03	$\mu g/m^3$	3.0E+03	$\mu g/m^3$	7E-07
				Methylene chloride	1.0E-02	$\mu g/m^3$	8.1E-06	$\mu g/m^3$	4.7E-07	$(\mu g/m^3)^{-1}$	4E-12	2.5E-03	$\mu g/m^3$	1.0E+03	$\mu g/m^3$	3E-06
				Tetrachloroethene	5.8E-01	$\mu g/m^3$	4.5E-04	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	3E-09	1.4E-01	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	5E-04
				1,2,3-Trichlorobenzene	7.4E-02	$\mu g/m^3$	5.8E-05	$\mu g/m^3$	NA	--	--	1.8E-02	$\mu g/m^3$	NA	--	--
				1,2,4-Trichlorobenzene	1.8E-01	$\mu g/m^3$	1.4E-04	$\mu g/m^3$	NA	--	--	4.4E-02	$\mu g/m^3$	2.0E+01	$\mu g/m^3$	2E-03
				1,1,2-Trichloroethane	1.6E-02	$\mu g/m^3$	1.2E-05	$\mu g/m^3$	1.6E-05	$(\mu g/m^3)^{-1}$	2E-10	3.9E-03	$\mu g/m^3$	NA	--	--
				Trichloroethene	2.8E+01	$\mu g/m^3$	2.2E-02	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	4E-08	6.9E+00	$\mu g/m^3$	NA	--	--
				o-Xylene	5.1E-02	$\mu g/m^3$	4.0E-05	$\mu g/m^3$	NA	--	--	1.2E-02	$\mu g/m^3$	4.0E+02	$\mu g/m^3$	3E-05
				Vinyl chloride	2.8E-01	$\mu g/m^3$	2.2E-04	$\mu g/m^3$	4.4E-06	$(\mu g/m^3)^{-1}$	1E-09	6.8E-02	$\mu g/m^3$	1.0E+02	$\mu g/m^3$	7E-04
				Naphthalene	2.2E-03	$\mu g/m^3$	1.7E-06	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	6E-11	5.4E-04	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	2E-04
				Phenanthrene	2.5E-04	$\mu g/m^3$	1.9E-07	$\mu g/m^3$	NA	--	--	6.0E-05	$\mu g/m^3$	NA	--	--
			Exposure Route Total								5E-08					4E-03
		Exposure Point Total									5E-05					7E+01
	Total of Receptor Risks Across Medium										5E-05					7E+01

Notes
NA - Not Available

TABLE 7.2.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Subchronic

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Onsite Groundwater	Top of the Groundwater Table	Dermal Absorption	Benzene	3.0E-03	mg/L	1.0E-08	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	6E-10	1.0E-05	mg/kg-day	1.2E-02	mg/kg-day	9E-04
				Chlorobenzene	1.7E-02	mg/L	1.1E-07	mg/kg-day	NA	--	--	1.1E-04	mg/kg-day	7.0E-02	mg/kg-day	2E-03
				Chloroform	2.8E-03	mg/L	4.9E-09	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	2E-10	4.8E-06	mg/kg-day	1.0E-01	mg/kg-day	5E-05
				1,2-Dibromo-3-chloropropane	7.7E-05	mg/L	2.1E-10	mg/kg-day	8.0E-01	(mg/kg-day)$^{-1}$	2E-10	2.0E-07	mg/kg-day	2.0E-03	mg/kg-day	1E-04
				Dibromochloromethane	5.5E-04	mg/L	5.9E-10	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	5E-11	5.8E-07	mg/kg-day	7.0E-02	mg/kg-day	8E-06
				1,2-Dichlorobenzene	7.2E-03	mg/L	7.4E-08	mg/kg-day	NA	--	--	7.3E-05	mg/kg-day	6.0E-01	mg/kg-day	1E-04
				1,3-Dichlorobenzene	1.4E-02	mg/L	2.0E-07	mg/kg-day	NA	--	--	1.9E-04	mg/kg-day	2.0E-02	mg/kg-day	1E-02
				1,4-Dichlorobenzene	1.9E-02	mg/L	2.0E-07	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	1E-09	1.9E-04	mg/kg-day	7.0E-02	mg/kg-day	3E-03
				1,1-Dichloroethane	2.9E-03	mg/L	4.9E-09	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	3E-11	4.8E-06	mg/kg-day	2.0E+00	mg/kg-day	2E-06
				1,2-Dichloroethane	4.6E-03	mg/L	4.7E-09	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	4E-10	4.6E-06	mg/kg-day	2.0E-02	mg/kg-day	2E-04
				1,1-Dichloroethene	6.8E-02	mg/L	1.9E-07	mg/kg-day	NA	--	--	1.9E-04	mg/kg-day	5.0E-02	mg/kg-day	4E-03
				cis-1,2-Dichloroethene	1.4E+02	mg/L	2.6E-04	mg/kg-day	NA	--	--	2.6E-01	mg/kg-day	2.0E-02	mg/kg-day	1E+01
				trans-1,2-Dichloroethene	5.8E-01	mg/L	1.1E-06	mg/kg-day	NA	--	--	1.1E-03	mg/kg-day	2.0E-01	mg/kg-day	5E-03
				Ethylbenzene	1.1E-02	mg/L	1.2E-07	mg/kg-day	1.1E-02	(mg/kg-day)$^{-1}$	1E-09	1.2E-04	mg/kg-day	1.0E-01	mg/kg-day	1E-03
				Methylcyclohexane	5.9E-03	mg/L	1.3E-07	mg/kg-day	NA	--	--	1.2E-04	mg/kg-day	NA	--	--
				Methylene chloride	7.0E-03	mg/L	5.9E-09	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	4E-11	5.8E-06	mg/kg-day	6.0E-02	mg/kg-day	1E-04
				Tetrachloroethene	5.4E-01	mg/L	4.7E-06	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	3E-06	4.7E-03	mg/kg-day	1.0E-01	mg/kg-day	5E-02
				1,2,3-Trichlorobenzene	7.4E-02	mg/L	1.5E-06	mg/kg-day	NA	--	--	1.4E-03	mg/kg-day	8.0E-03	mg/kg-day	2E-01
				1,2,4-Trichlorobenzene	1.8E-01	mg/L	3.2E-06	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	9E-08	3.2E-03	mg/kg-day	1.0E-01	mg/kg-day	3E-02
				1,1,2-Trichloroethane	1.4E-02	mg/L	2.3E-08	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	1E-09	2.2E-05	mg/kg-day	4.0E-03	mg/kg-day	6E-03
				Trichloroethene	2.3E+01	mg/L	6.9E-05	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	4E-07	6.8E-02	mg/kg-day	NA	--	--
				o-Xylene	3.8E-02	mg/L	4.0E-07	mg/kg-day	NA	--	--	4.0E-04	mg/kg-day	4.0E-01	mg/kg-day	1E-03
				Vinyl chloride	1.6E-01	mg/L	2.1E-07	mg/kg-day	7.2E-01	(mg/kg-day)$^{-1}$	2E-07	2.1E-04	mg/kg-day	3.0E-03	mg/kg-day	7E-02
				Benzo(a)anthracene	6.1E-04	mg/L	1.0E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	8E-08	1.0E-04	mg/kg-day	NA	--	--
				Benzo(a)pyrene	3.5E-04	mg/L	1.0E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	7E-07	1.0E-04	mg/kg-day	NA	--	--
				Benzo(b)fluoranthene	2.1E-03	mg/L	6.1E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	4E-07	6.0E-04	mg/kg-day	NA	--	--
				Benzo(g,h,i)perylene	3.7E-04	mg/L	2.1E-07	mg/kg-day	NA	--	--	2.0E-04	mg/kg-day	NA	--	--
				Benzo(k)fluoranthene	7.2E-04	mg/L	2.1E-07	mg/kg-day	7.3E-02	(mg/kg-day)$^{-1}$	2E-08	2.0E-04	mg/kg-day	NA	--	--
				1,1-Biphenyl	2.7E-03	mg/L	6.0E-08	mg/kg-day	NA	--	--	5.9E-05	mg/kg-day	1.0E-01	mg/kg-day	6E-04
				Dibenzo(a,h)anthracene	1.4E-03	mg/L	6.0E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	4E-06	5.9E-04	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	3.8E-04	mg/L	1.2E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	8E-08	1.1E-04	mg/kg-day	NA	--	--
				Naphthalene	2.0E-03	mg/L	2.1E-08	mg/kg-day	NA	--	--	2.1E-05	mg/kg-day	2.0E-01	mg/kg-day	1E-04
				Phenanthrene	5.2E-04	mg/L	1.9E-08	mg/kg-day	NA	--	--	1.9E-05	mg/kg-day	NA	--	--
				Total PCB Aroclors	1.2E-02	mg/L	3.0E-06	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	1E-06	2.9E-03	mg/kg-day	6.0E-05	mg/kg-day	5E+01
				alpha-BHC	4.9E-04	mg/L	2.9E-09	mg/kg-day	6.3E+00	(mg/kg-day)$^{-1}$	2E-08	2.8E-06	mg/kg-day	8.0E-03	mg/kg-day	4E-04
				delta-BHC	1.4E-03	mg/L	1.4E-08	mg/kg-day	NA	--	--	1.3E-05	mg/kg-day	NA	--	--
				gamma-BHC	2.0E-04	mg/L	1.0E-09	mg/kg-day	1.1E+00	(mg/kg-day)$^{-1}$	1E-09	1.0E-06	mg/kg-day	3.0E-03	mg/kg-day	3E-04
				gamma-Chlordane	2.2E-03	mg/L	6.5E-08	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	2E-08	6.4E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				4,4'-DDD	5.9E-04	mg/L	5.4E-08	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	1E-08	5.3E-05	mg/kg-day	NA	--	--
				4,4'-DDE	1.3E-03	mg/L	1.0E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	4E-08	1.0E-04	mg/kg-day	NA	--	--
				4,4'-DDT	2.0E-03	mg/L	3.1E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	1E-07	3.0E-04	mg/kg-day	5.0E-04	mg/kg-day	6E-01
				Dieldrin	4.7E-04	mg/L	4.3E-09	mg/kg-day	1.6E+01	(mg/kg-day)$^{-1}$	7E-08	4.3E-06	mg/kg-day	1.0E-04	mg/kg-day	4E-02
				Endosulfan II	1.1E-03	mg/L	3.7E-09	mg/kg-day	NA	--	--	3.6E-06	mg/kg-day	6.0E-03	mg/kg-day	6E-04
				Endosulfan sulfate	4.5E-04	mg/L	1.0E-09	mg/kg-day	NA	--	--	9.9E-07	mg/kg-day	NA	--	--
				Endrin aldehyde	7.7E-04	mg/L	1.3E-08	mg/kg-day	NA	--	--	1.3E-05	mg/kg-day	NA	--	--
				Heptachlor	8.7E-04	mg/L	5.4E-09	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	2E-08	5.3E-06	mg/kg-day	5.0E-04	mg/kg-day	1E-02
				2,3,7,8-TCDD Toxic Equivalence	5.4E-08	mg/L	1.4E-11	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	2E-06	1.4E-08	mg/kg-day	2.0E-08	mg/kg-day	7E-01
				Aluminum	1.8E+00	mg/L	4.1E-07	mg/kg-day	NA	--	--	4.0E-04	mg/kg-day	1.0E+00	mg/kg-day	4E-04
				Arsenic	1.4E-01	mg/L	3.1E-08	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	5E-08	3.0E-05	mg/kg-day	3.0E-04	mg/kg-day	1E-01
				Barium	8.2E-01	mg/L	1.8E-07	mg/kg-day	NA	--	--	1.8E-04	mg/kg-day	1.4E-02	mg/kg-day	1E-02
				Cadmium	3.3E-03	mg/L	7.4E-10	mg/kg-day	NA	--	--	7.2E-07	mg/kg-day	2.5E-05	mg/kg-day	3E-02
				Chromium	2.9E-02	mg/L	1.3E-08	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	3E-07	1.3E-05	mg/kg-day	5.0E-04	mg/kg-day	3E-02
				Cobalt	9.3E-04	mg/L	8.2E-11	mg/kg-day	NA	--	--	8.1E-08	mg/kg-day	3.0E-03	mg/kg-day	3E-05
				Iron	2.7E+00	mg/L	6.0E-07	mg/kg-day	NA	--	--	5.9E-04	mg/kg-day	7.0E-01	mg/kg-day	8E-04
				Manganese	6.7E-01	mg/L	1.5E-07	mg/kg-day	NA	--	--	1.4E-04	mg/kg-day	9.6E-04	mg/kg-day	2E-01
				Vanadium	7.8E-03	mg/L	1.7E-09	mg/kg-day	NA	--	--	1.7E-06	mg/kg-day	1.3E-04	mg/kg-day	1E-02
			Exposure Route Total								1E-05					6E+01

TABLE 7.2.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Subchronic Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Onsite Groundwater	Outdoor Air Around an Excavation	Inhalation	Benzene	4.7E-03	μg/m^3	9.2E-07	μg/m^3	7.8E-06	$(\mu g/m^3)^{-1}$	7E-12	9.1E-04	μg/m^3	9.0E+01	μg/m^3	1E-05
				Chlorobenzene	1.9E-02	μg/m^3	3.7E-06	μg/m^3	NA	--	--	3.6E-03	μg/m^3	5.0E+02	μg/m^3	7E-06
				Chloroform	3.6E-03	μg/m^3	7.0E-07	μg/m^3	2.3E-05	$(\mu g/m^3)^{-1}$	2E-11	6.9E-04	μg/m^3	2.4E+02	μg/m^3	3E-06
				1,2-Dibromo-3-chloropropane	5.3E-05	μg/m^3	1.0E-08	μg/m^3	6.0E-03	$(\mu g/m^3)^{-1}$	6E-11	1.0E-05	μg/m^3	2.0E+00	μg/m^3	5E-06
				Dibromochloromethane	5.0E-04	μg/m^3	9.8E-08	μg/m^3	2.7E-05	$(\mu g/m^3)^{-1}$	3E-12	9.6E-05	μg/m^3	NA	--	--
				1,2-Dichlorobenzene	8.1E-03	μg/m^3	1.6E-06	μg/m^3	NA	--	--	1.6E-03	μg/m^3	2.0E+03	μg/m^3	8E-07
				1,3-Dichlorobenzene	1.6E-02	μg/m^3	3.1E-06	μg/m^3	NA	--	--	3.1E-03	μg/m^3	NA	--	--
				1,4-Dichlorobenzene	2.2E-02	μg/m^3	4.2E-06	μg/m^3	1.1E-05	$(\mu g/m^3)^{-1}$	5E-11	4.1E-03	μg/m^3	2.4E+03	μg/m^3	2E-06
				1,1-Dichloroethane	4.1E-03	μg/m^3	8.0E-07	μg/m^3	1.6E-06	$(\mu g/m^3)^{-1}$	1E-12	7.8E-04	μg/m^3	NA	--	--
				1,2-Dichloroethane	6.1E-03	μg/m^3	1.2E-06	μg/m^3	2.6E-05	$(\mu g/m^3)^{-1}$	3E-11	1.2E-03	μg/m^3	7.0E+01	μg/m^3	2E-05
				1,1-Dichloroethene	9.7E-02	μg/m^3	1.9E-05	μg/m^3	NA	--	--	1.9E-02	μg/m^3	2.0E+02	μg/m^3	9E-05
				cis-1,2-Dichloroethene	2.0E+02	μg/m^3	3.8E-02	μg/m^3	NA	--	--	3.8E+01	μg/m^3	NA	--	--
				trans-1,2-Dichloroethene	8.2E-01	μg/m^3	1.6E-04	μg/m^3	NA	--	--	1.6E-01	μg/m^3	7.9E+02	μg/m^3	2E-04
				Ethylbenzene	1.5E-02	μg/m^3	2.9E-06	μg/m^3	2.5E-06	$(\mu g/m^3)^{-1}$	7E-12	2.8E-03	μg/m^3	9.0E+03	μg/m^3	3E-07
				Methylcyclohexane	8.3E-03	μg/m^3	1.6E-06	μg/m^3	NA	--	--	1.6E-03	μg/m^3	3.0E+03	μg/m^3	5E-07
				Methylene chloride	1.0E-02	μg/m^3	2.0E-06	μg/m^3	4.7E-07	$(\mu g/m^3)^{-1}$	1E-12	2.0E-03	μg/m^3	1.0E+03	μg/m^3	2E-06
				Tetrachloroethene	5.8E-01	μg/m^3	1.1E-04	μg/m^3	5.9E-06	$(\mu g/m^3)^{-1}$	7E-10	1.1E-01	μg/m^3	2.7E+02	μg/m^3	4E-04
				1,2,3-Trichlorobenzene	7.4E-02	μg/m^3	1.5E-05	μg/m^3	NA	--	--	1.4E-02	μg/m^3	NA	--	--
				1,2,4-Trichlorobenzene	1.8E-01	μg/m^3	3.5E-05	μg/m^3	NA	--	--	3.5E-02	μg/m^3	2.0E+01	μg/m^3	2E-03
				1,1,2-Trichloroethane	1.6E-02	μg/m^3	3.1E-06	μg/m^3	1.6E-05	$(\mu g/m^3)^{-1}$	5E-11	3.0E-03	μg/m^3	NA	--	--
				Trichloroethene	2.8E+01	μg/m^3	5.5E-03	μg/m^3	2.0E-06	$(\mu g/m^3)^{-1}$	1E-08	5.4E+00	μg/m^3	NA	--	--
				o-Xylene	5.1E-02	μg/m^3	1.0E-05	μg/m^3	NA	--	--	9.8E-03	μg/m^3	4.0E+02	μg/m^3	2E-05
				Vinyl chloride	2.8E-01	μg/m^3	5.5E-05	μg/m^3	4.4E-06	$(\mu g/m^3)^{-1}$	2E-10	5.4E-02	μg/m^3	1.0E+02	μg/m^3	5E-04
				Naphthalene	2.2E-03	μg/m^3	4.4E-07	μg/m^3	3.4E-05	$(\mu g/m^3)^{-1}$	1E-11	4.3E-04	μg/m^3	3.0E+00	μg/m^3	1E-04
				Phenanthrene	2.5E-04	μg/m^3	4.8E-08	μg/m^3	NA	--	--	4.8E-05	μg/m^3	NA	--	--
			Exposure Route Total								1E-08					3E-03
		Exposure Point Total									1E-05					6E+01
	Total of Receptor Risks Across Medium										1E-05					6E+01

Notes
NA - Not Available

TABLE 7.3.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, SBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Offsite Groundwater, South of Bound Brook (SBB)	Top of the Groundwater Table	Dermal Absorption	Benzene	5.0E-04	mg/L	6.6E-09	mg/kg-day	5.5E-02	$(mg/kg\text{-}day)^{-1}$	4E-10	2.1E-06	mg/kg-day	1.2E-02	mg/kg-day	2E-04
				Chloroform	1.1E-03	mg/L	7.3E-09	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	2E-10	2.3E-06	mg/kg-day	1.0E-01	mg/kg-day	2E-05
				Dibromochloromethane	5.1E-04	mg/L	2.0E-09	mg/kg-day	8.4E-02	$(mg/kg\text{-}day)^{-1}$	2E-10	6.3E-07	mg/kg-day	7.0E-02	mg/kg-day	9E-06
				cis-1,2-Dichloroethene	1.7E-02	mg/L	1.2E-07	mg/kg-day	NA	--	--	3.9E-05	mg/kg-day	2.0E-02	mg/kg-day	2E-03
				Methyl tert-butyl ether	1.9E-01	mg/L	3.8E-07	mg/kg-day	1.8E-03	$(mg/kg\text{-}day)^{-1}$	7E-10	1.2E-04	mg/kg-day	3.0E-01	mg/kg-day	4E-04
				Tetrachloroethene	1.9E-03	mg/L	6.3E-08	mg/kg-day	5.4E-01	$(mg/kg\text{-}day)^{-1}$	3E-08	2.0E-05	mg/kg-day	1.0E-01	mg/kg-day	2E-04
				Trichloroethene	1.1E+00	mg/L	1.3E-05	mg/kg-day	5.9E-03	$(mg/kg\text{-}day)^{-1}$	7E-08	3.9E-03	mg/kg-day	NA	--	--
				Dibenzo(a,h)anthracene	2.4E-03	mg/L	3.7E-06	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3E-05	1.2E-03	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	1.1E-04	mg/L	1.2E-07	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8E-08	3.6E-05	mg/kg-day	NA	--	--
				Naphthalene	1.3E-04	mg/L	5.2E-09	mg/kg-day	NA	--	--	1.6E-06	mg/kg-day	2.0E-01	mg/kg-day	8E-06
				Total PCB Aroclors	5.1E-03	mg/L	4.5E-06	mg/kg-day	4.0E-01	$(mg/kg\text{-}day)^{-1}$	2E-06	1.4E-03	mg/kg-day	6.0E-05	mg/kg-day	2E+01
				2,3,7,8-TCDD Toxic Equivalence	1.7E-09	mg/L	1.5E-12	mg/kg-day	1.6E+05	$(mg/kg\text{-}day)^{-1}$	2E-07	4.8E-10	mg/kg-day	2.0E-08	mg/kg-day	2E-02
				Arsenic	3.7E-02	mg/L	3.3E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5E-08	1.0E-05	mg/kg-day	3.0E-04	mg/kg-day	3E-02
				Barium	8.3E+00	mg/L	7.3E-06	mg/kg-day	NA	--	--	2.3E-03	mg/kg-day	1.4E-02	mg/kg-day	2E-01
				Chromium	5.7E-04	mg/L	1.0E-09	mg/kg-day	2.0E+01	$(mg/kg\text{-}day)^{-1}$	2E-08	3.1E-07	mg/kg-day	5.0E-04	mg/kg-day	6E-04
				Manganese	3.2E-01	mg/L	2.9E-07	mg/kg-day	NA	--	--	8.9E-05	mg/kg-day	9.6E-04	mg/kg-day	9E-02
			Exposure Route Total								3E-05					2E+01
		Outdoor Air Around an Excavation	Inhalation	Benzene	7.9E-04	$\mu g/m^3$	6.1E-07	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	5E-12	1.9E-04	$\mu g/m^3$	9.0E+01	$\mu g/m^3$	2E-06
				Chloroform	1.4E-03	$\mu g/m^3$	1.1E-06	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	3E-11	3.4E-04	$\mu g/m^3$	2.4E+02	$\mu g/m^3$	1E-06
				Dibromochloromethane	4.7E-04	$\mu g/m^3$	3.7E-07	$\mu g/m^3$	2.7E-05	$(\mu g/m^3)^{-1}$	1E-11	1.1E-04	$\mu g/m^3$	NA	--	--
				cis-1,2-Dichloroethene	2.4E-02	$\mu g/m^3$	1.9E-05	$\mu g/m^3$	NA	--	--	5.8E-03	$\mu g/m^3$	NA	--	--
				Methyl tert-butyl ether	2.7E-01	$\mu g/m^3$	2.2E-04	$\mu g/m^3$	2.6E-07	$(\mu g/m^3)^{-1}$	6E-11	6.7E-02	$\mu g/m^3$	3.0E+03	$\mu g/m^3$	2E-05
				Tetrachloroethene	2.1E-03	$\mu g/m^3$	1.6E-06	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	1E-11	5.0E-04	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	2E-06
				Trichloroethene	1.4E+00	$\mu g/m^3$	1.1E-03	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	2E-09	3.4E-01	$\mu g/m^3$	NA	--	--
				Naphthalene	1.4E-04	$\mu g/m^3$	1.1E-07	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	4E-12	3.4E-05	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	1E-05
			Exposure Route Total								2E-09					4E-05
		Exposure Point Total									3E-05					2E+01
	Total of Receptor Risks Across Medium										3E-05					2E+01

Notes
NA - Not Available

TABLE 7.3.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, SBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Subchronic

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Offsite Groundwater, South of Bound Brook (SBB)	Top of the Groundwater Table	Dermal Absorption	Benzene	5.0E-04	mg/L	1.7E-09	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	1E-10	1.7E-06	mg/kg-day	1.2E-02	mg/kg-day	1E-04
				Chloroform	1.1E-03	mg/L	1.9E-09	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	6E-11	1.9E-06	mg/kg-day	1.0E-01	mg/kg-day	2E-05
				Dibromochloromethane	5.1E-04	mg/L	5.5E-10	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	5E-11	5.4E-07	mg/kg-day	7.0E-02	mg/kg-day	8E-06
				cis-1,2-Dichloroethene	1.7E-02	mg/L	3.2E-08	mg/kg-day	NA	--	--	3.1E-05	mg/kg-day	2.0E-02	mg/kg-day	2E-03
				Methyl tert-butyl ether	1.9E-01	mg/L	9.8E-08	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	2E-10	9.7E-05	mg/kg-day	3.0E-01	mg/kg-day	3E-04
				Tetrachloroethene	1.9E-03	mg/L	1.7E-08	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	9E-09	1.7E-05	mg/kg-day	1.0E-01	mg/kg-day	2E-04
				Trichloroethene	1.1E+00	mg/L	3.4E-06	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	2E-08	3.3E-03	mg/kg-day	NA	--	--
				Dibenzo(a,h)anthracene	2.4E-03	mg/L	1.1E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	8E-06	1.0E-03	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	1.1E-04	mg/L	3.3E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	2E-08	3.3E-05	mg/kg-day	NA	--	--
				Naphthalene	1.3E-04	mg/L	1.3E-09	mg/kg-day	NA	--	--	1.3E-06	mg/kg-day	2.0E-01	mg/kg-day	7E-06
				Total PCB Aroclors	5.1E-03	mg/L	1.3E-06	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	5E-07	1.3E-03	mg/kg-day	6.0E-05	mg/kg-day	2E+01
				2,3,7,8-TCDD Toxic Equivalence	1.7E-09	mg/L	4.5E-13	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	7E-08	4.4E-10	mg/kg-day	2.0E-08	mg/kg-day	2E-02
				Arsenic	3.7E-02	mg/L	8.2E-09	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1E-08	8.0E-06	mg/kg-day	3.0E-04	mg/kg-day	3E-02
				Barium	8.3E+00	mg/L	1.8E-06	mg/kg-day	NA	--	--	1.8E-03	mg/kg-day	1.4E-02	mg/kg-day	1E-01
				Chromium	5.7E-04	mg/L	2.5E-10	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	5E-09	2.5E-07	mg/kg-day	5.0E-04	mg/kg-day	5E-04
				Manganese	3.2E-01	mg/L	7.2E-08	mg/kg-day	NA	--	--	7.1E-05	mg/kg-day	9.6E-04	mg/kg-day	7E-02
			Exposure Route Total								8E-06					2E+01
		Outdoor Air Around an Excavation	Inhalation	Benzene	7.9E-04	μg/m^3	1.5E-07	μg/m^3	7.8E-06	(μg/m^3)$^{-1}$	1E-12	1.5E-04	μg/m^3	9.0E+01	μg/m^3	2E-06
				Chloroform	1.4E-03	μg/m^3	2.7E-07	μg/m^3	2.3E-05	(μg/m^3)$^{-1}$	6E-12	2.7E-04	μg/m^3	2.4E+02	μg/m^3	1E-06
				Dibromochloromethane	4.7E-04	μg/m^3	9.1E-08	μg/m^3	2.7E-05	(μg/m^3)$^{-1}$	2E-12	9.0E-05	μg/m^3	NA	--	--
				cis-1,2-Dichloroethene	2.4E-02	μg/m^3	4.7E-06	μg/m^3	NA	--	--	4.6E-03	μg/m^3	NA	--	--
				Methyl tert-butyl ether	2.7E-01	μg/m^3	5.4E-05	μg/m^3	2.6E-07	(μg/m^3)$^{-1}$	1E-11	5.3E-02	μg/m^3	3.0E+03	μg/m^3	2E-05
				Tetrachloroethene	2.1E-03	μg/m^3	4.0E-07	μg/m^3	5.9E-06	(μg/m^3)$^{-1}$	2E-12	4.0E-04	μg/m^3	2.7E+02	μg/m^3	1E-06
				Trichloroethene	1.4E+00	μg/m^3	2.7E-04	μg/m^3	2.0E-06	(μg/m^3)$^{-1}$	5E-10	2.7E-01	μg/m^3	NA	--	--
				Naphthalene	1.4E-04	μg/m^3	2.7E-08	μg/m^3	3.4E-05	(μg/m^3)$^{-1}$	9E-13	2.7E-05	μg/m^3	3.0E+00	μg/m^3	9E-06
			Exposure Route Total								6E-10					3E-05
		Exposure Point Total									8E-06					2E+01
	Total of Receptor Risks Across Medium										8E-06					2E+01

Notes
NA - Not Available

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, NBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Offsite Groundwater, North of Bound Brook (NBB)	Top of the Groundwater Table	Dermal Absorption	Benzene	1.2E-03	mg/L	1.6E-08	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	9E-10	5.1E-06	mg/kg-day	1.2E-02	mg/kg-day	4E-04
				Bromodichloromethane	3.5E-04	mg/L	1.7E-09	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	1E-10	5.3E-07	mg/kg-day	2.0E-02	mg/kg-day	3E-05
				Chloroform	1.4E-03	mg/L	9.6E-09	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	3E-10	3.0E-06	mg/kg-day	1.0E-01	mg/kg-day	3E-05
				cis-1,2-Dichloroethene	4.9E-02	mg/L	3.6E-07	mg/kg-day	NA	--	--	1.1E-04	mg/kg-day	2.0E-02	mg/kg-day	6E-03
				Tetrachloroethene	3.8E-04	mg/L	1.2E-08	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	7E-09	3.9E-06	mg/kg-day	1.0E-01	mg/kg-day	4E-05
				Trichloroethene	2.4E-01	mg/L	2.6E-06	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	2E-08	8.2E-04	mg/kg-day	NA	--	--
				Vinyl chloride	3.6E-04	mg/L	1.9E-09	mg/kg-day	7.2E-01	(mg/kg-day)$^{-1}$	1E-09	5.8E-07	mg/kg-day	3.0E-03	mg/kg-day	2E-04
				Benzo(g,h,i)perylene	9.8E-05	mg/L	1.8E-07	mg/kg-day	NA	--	--	5.7E-05	mg/kg-day	NA	--	--
				bis(2-Ethylhexyl)phthalate	5.2E-03	mg/L	3.7E-07	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	5E-09	1.1E-04	mg/kg-day	2.0E-01	mg/kg-day	6E-04
				Indeno(1,2,3-cd)pyrene	1.2E-04	mg/L	1.3E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	9E-08	4.0E-05	mg/kg-day	NA	--	--
				Naphthalene	1.1E-04	mg/L	4.6E-09	mg/kg-day	NA	--	--	1.4E-06	mg/kg-day	2.0E-01	mg/kg-day	7E-06
				Total PCB Aroclors	4.8E-04	mg/L	4.2E-07	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	2E-07	1.3E-04	mg/kg-day	6.0E-05	mg/kg-day	2E+00
				beta-BHC	3.5E-04	mg/L	7.0E-09	mg/kg-day	1.8E+00	(mg/kg-day)$^{-1}$	1E-08	2.2E-06	mg/kg-day	6.0E-04	mg/kg-day	4E-03
				delta-BHC	4.2E-04	mg/L	1.4E-08	mg/kg-day	NA	--	--	4.5E-06	mg/kg-day	NA	--	--
				4,4'-DDD	7.6E-04	mg/L	2.4E-07	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	6E-08	7.6E-05	mg/kg-day	NA	--	--
				4,4'-DDE	7.5E-04	mg/L	2.1E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	7E-08	6.5E-05	mg/kg-day	NA	--	--
				4,4'-DDT	9.6E-04	mg/L	5.1E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-07	1.6E-04	mg/kg-day	5.0E-04	mg/kg-day	3E-01
				Heptachlor	2.0E-04	mg/L	4.4E-09	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	2E-08	1.4E-06	mg/kg-day	5.0E-04	mg/kg-day	3E-03
				Antimony	2.2E-03	mg/L	1.9E-09	mg/kg-day	NA	--	--	6.1E-07	mg/kg-day	6.0E-05	mg/kg-day	1E-02
				Arsenic	1.1E-01	mg/L	9.5E-08	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1E-07	3.0E-05	mg/kg-day	3.0E-04	mg/kg-day	1E-01
				Chromium	1.2E-03	mg/L	2.1E-09	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	4E-08	6.5E-07	mg/kg-day	5.0E-04	mg/kg-day	1E-03
				Cobalt	4.3E-04	mg/L	1.5E-10	mg/kg-day	NA	--	--	4.8E-08	mg/kg-day	3.0E-03	mg/kg-day	2E-05
				Manganese	5.9E-01	mg/L	5.2E-07	mg/kg-day	NA	--	--	1.6E-04	mg/kg-day	9.6E-04	mg/kg-day	2E-01
				Vanadium	8.4E-03	mg/L	7.5E-09	mg/kg-day	NA	--	--	2.3E-06	mg/kg-day	1.3E-04	mg/kg-day	2E-02
			Exposure Route Total								8E-07					3E+00
		Outdoor Air Around an Excavation	Inhalation	Benzene	1.9E-03	µg/m^3	1.5E-06	µg/m^3	7.8E-06	(µg/m^3)$^{-1}$	1E-11	4.7E-04	µg/m^3	9.0E+01	µg/m^3	5E-06
				Bromodichloromethane	3.7E-04	µg/m^3	2.9E-07	µg/m^3	3.7E-05	(µg/m^3)$^{-1}$	1E-11	9.1E-05	µg/m^3	2.0E+01	µg/m^3	5E-06
				Chloroform	1.8E-03	µg/m^3	1.4E-06	µg/m^3	2.3E-05	(µg/m^3)$^{-1}$	3E-11	4.5E-04	µg/m^3	2.4E+02	µg/m^3	2E-06
				cis-1,2-Dichloroethene	6.8E-02	µg/m^3	5.3E-05	µg/m^3	NA	--	--	1.7E-02	µg/m^3	NA	--	--
				Tetrachloroethene	4.1E-04	µg/m^3	3.2E-07	µg/m^3	5.9E-06	(µg/m^3)$^{-1}$	2E-12	9.9E-05	µg/m^3	2.7E+02	µg/m^3	4E-07
				Trichloroethene	2.9E-01	µg/m^3	2.3E-04	µg/m^3	2.0E-06	(µg/m^3)$^{-1}$	5E-10	7.1E-02	µg/m^3	NA	--	--
				Vinyl chloride	6.4E-04	µg/m^3	5.0E-07	µg/m^3	4.4E-06	(µg/m^3)$^{-1}$	2E-12	1.6E-04	µg/m^3	1.0E+02	µg/m^3	2E-06
				Naphthalene	1.3E-04	µg/m^3	9.9E-08	µg/m^3	3.4E-05	(µg/m^3)$^{-1}$	3E-12	3.1E-05	µg/m^3	3.0E+00	µg/m^3	1E-05
			Exposure Route Total								5E-10					2E-05
		Exposure Point Total									8E-07					3E+00
	Total of Receptor Risks Across Medium										8E-07					3E+00

TABLE 7.4.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, NBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Subchronic Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Offsite Groundwater, North of Bound Brook (NBB)	Top of the Groundwater Table	Dermal Absorption	Benzene	1.2E-03	mg/L	4.2E-09	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	2E-10	4.2E-06	mg/kg-day	1.2E-02	mg/kg-day	3E-04
				Bromodichloromethane	3.5E-04	mg/L	4.5E-10	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	3E-11	4.5E-07	mg/kg-day	2.0E-02	mg/kg-day	2E-05
				Chloroform	1.4E-03	mg/L	2.5E-09	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	8E-11	2.5E-06	mg/kg-day	1.0E-01	mg/kg-day	2E-05
				cis-1,2-Dichloroethene	4.9E-02	mg/L	9.1E-08	mg/kg-day	NA	--	--	9.0E-05	mg/kg-day	2.0E-02	mg/kg-day	4E-03
				Tetrachloroethene	3.8E-04	mg/L	3.3E-09	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	2E-09	3.3E-06	mg/kg-day	1.0E-01	mg/kg-day	3E-05
				Trichloroethene	2.4E-01	mg/L	7.1E-07	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	4E-09	7.0E-04	mg/kg-day	NA	--	--
				Vinyl chloride	3.6E-04	mg/L	4.8E-10	mg/kg-day	7.2E-01	(mg/kg-day)$^{-1}$	3E-10	4.7E-07	mg/kg-day	3.0E-03	mg/kg-day	2E-04
				Benzo(g,h,i)perylene	9.8E-05	mg/L	5.4E-08	mg/kg-day	NA	--	--	5.3E-05	mg/kg-day	NA	--	--
				bis(2-Ethylhexyl)phthalate	5.2E-03	mg/L	1.1E-07	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	1E-09	1.0E-04	mg/kg-day	2.0E-01	mg/kg-day	5E-04
				Indeno(1,2,3-cd)pyrene	1.2E-04	mg/L	3.7E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	3E-08	3.6E-05	mg/kg-day	NA	--	--
				Naphthalene	1.1E-04	mg/L	1.2E-09	mg/kg-day	NA	--	--	1.2E-06	mg/kg-day	2.0E-01	mg/kg-day	6E-06
				Total PCB Aroclors	4.8E-04	mg/L	1.2E-07	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	5E-08	1.2E-04	mg/kg-day	6.0E-05	mg/kg-day	2E+00
				beta-BHC	3.5E-04	mg/L	1.9E-09	mg/kg-day	1.8E+00	(mg/kg-day)$^{-1}$	3E-09	1.9E-06	mg/kg-day	6.0E-04	mg/kg-day	3E-03
				delta-BHC	4.2E-04	mg/L	4.2E-09	mg/kg-day	NA	--	--	4.1E-06	mg/kg-day	NA	--	--
				4,4'-DDD	7.6E-04	mg/L	7.0E-08	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	2E-08	6.9E-05	mg/kg-day	NA	--	--
				4,4'-DDE	7.5E-04	mg/L	5.8E-08	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-08	5.7E-05	mg/kg-day	NA	--	--
				4,4'-DDT	9.6E-04	mg/L	1.5E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	5E-08	1.4E-04	mg/kg-day	5.0E-04	mg/kg-day	3E-01
				Heptachlor	2.0E-04	mg/L	1.3E-09	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	6E-09	1.2E-06	mg/kg-day	5.0E-04	mg/kg-day	2E-03
				Antimony	2.2E-03	mg/L	4.9E-10	mg/kg-day	NA	--	--	4.8E-07	mg/kg-day	6.0E-05	mg/kg-day	8E-03
				Arsenic	1.1E-01	mg/L	2.4E-08	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	4E-08	2.3E-05	mg/kg-day	3.0E-04	mg/kg-day	8E-02
				Chromium	1.2E-03	mg/L	5.2E-10	mg/kg-day	2.0E+01	(mg/kg-day)$^{-1}$	1E-08	5.1E-07	mg/kg-day	5.0E-04	mg/kg-day	1E-03
				Cobalt	4.3E-04	mg/L	3.8E-11	mg/kg-day	NA	--	--	3.8E-08	mg/kg-day	3.0E-03	mg/kg-day	1E-05
				Manganese	5.9E-01	mg/L	1.3E-07	mg/kg-day	NA	--	--	1.3E-04	mg/kg-day	9.6E-04	mg/kg-day	1E-01
				Vanadium	8.4E-03	mg/L	1.9E-09	mg/kg-day	NA	--	--	1.8E-06	mg/kg-day	1.3E-04	mg/kg-day	1E-02
			Exposure Route Total								2E-07					3E+00
		Outdoor Air Around an Excavation	Inhalation	Benzene	1.9E-03	$\mu g/m^3$	3.8E-07	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	3E-12	3.7E-04	$\mu g/m^3$	9.0E+01	$\mu g/m^3$	4E-06
				Bromodichloromethane	3.7E-04	$\mu g/m^3$	7.3E-08	$\mu g/m^3$	3.7E-05	$(\mu g/m^3)^{-1}$	3E-12	7.2E-05	$\mu g/m^3$	2.0E+01	$\mu g/m^3$	4E-06
				Chloroform	1.8E-03	$\mu g/m^3$	3.6E-07	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	8E-12	3.5E-04	$\mu g/m^3$	2.4E+02	$\mu g/m^3$	1E-06
				cis-1,2-Dichloroethene	6.8E-02	$\mu g/m^3$	1.3E-05	$\mu g/m^3$	NA	--	--	1.3E-02	$\mu g/m^3$	NA	--	--
				Tetrachloroethene	4.1E-04	$\mu g/m^3$	8.0E-08	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	5E-13	7.8E-05	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	3E-07
				Trichloroethene	2.9E-01	$\mu g/m^3$	5.7E-05	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	1E-10	5.6E-02	$\mu g/m^3$	NA	--	--
				Vinyl chloride	6.4E-04	$\mu g/m^3$	1.2E-07	$\mu g/m^3$	4.4E-06	$(\mu g/m^3)^{-1}$	5E-13	1.2E-04	$\mu g/m^3$	1.0E+02	$\mu g/m^3$	1E-06
				Naphthalene	1.3E-04	$\mu g/m^3$	2.5E-08	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	8E-13	2.4E-05	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	8E-06
			Exposure Route Total								1E-10					2E-05
		Exposure Point Total									2E-07					3E+00
	Total of Receptor Risks Across Medium										2E-07					3E+00

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Tap Water	Ingestion	Benzene	7.2E-04	mg/L	6.8E-06	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	6E-07	2.0E-05	mg/kg-day	4.0E-03	mg/kg-day	5E-03
				Bromodichloromethane	4.1E-04	mg/L	3.8E-06	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	4E-07	1.1E-05	mg/kg-day	2.0E-02	mg/kg-day	6E-04
				Chlorobenzene	3.7E-03	mg/L	3.5E-05	mg/kg-day	NA	--	--	1.0E-04	mg/kg-day	2.0E-02	mg/kg-day	5E-03
				Chloroform	2.8E-03	mg/L	2.6E-05	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	1E-06	7.6E-05	mg/kg-day	1.0E-02	mg/kg-day	8E-03
				Dibromochloromethane	3.4E-04	mg/L	3.2E-06	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	4E-07	9.4E-06	mg/kg-day	2.0E-02	mg/kg-day	5E-04
				1,2-Dichlorobenzene	2.1E-03	mg/L	2.0E-05	mg/kg-day	NA	--	--	5.9E-05	mg/kg-day	9.0E-02	mg/kg-day	7E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	4.9E-05	mg/kg-day	NA	--	--	1.4E-04	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	4.7E-05	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	4E-07	1.4E-04	mg/kg-day	7.0E-02	mg/kg-day	2E-03
				1,1-Dichloroethane	7.0E-04	mg/L	6.6E-06	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	6E-08	1.9E-05	mg/kg-day	2.0E-01	mg/kg-day	1E-04
				1,2-Dichloroethane	5.6E-04	mg/L	5.2E-06	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	8E-07	1.5E-05	mg/kg-day	NA	--	--
				1,1-Dichloroethene	5.7E-03	mg/L	5.4E-05	mg/kg-day	NA	--	--	1.6E-04	mg/kg-day	5.0E-02	mg/kg-day	3E-03
				cis-1,2-Dichloroethene	1.4E+01	mg/L	1.3E-01	mg/kg-day	NA	--	--	3.9E-01	mg/kg-day	2.0E-03	mg/kg-day	2E+02
				trans-1,2-Dichloroethene	6.1E-02	mg/L	5.7E-04	mg/kg-day	NA	--	--	1.7E-03	mg/kg-day	2.0E-02	mg/kg-day	8E-02
				Methyl tert-butyl ether	1.3E-02	mg/L	1.2E-04	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	3E-07	3.4E-04	mg/kg-day	NA	--	--
				Methylene chloride	5.0E-04	mg/L	4.7E-06	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	6E-08	1.4E-05	mg/kg-day	6.0E-02	mg/kg-day	2E-04
				Tetrachloroethene	3.6E-02	mg/L	3.4E-04	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	3E-04	9.9E-04	mg/kg-day	1.0E-02	mg/kg-day	1E-01
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	7.9E-05	mg/kg-day	NA	--	--	2.3E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	5.5E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	3E-05	1.6E-03	mg/kg-day	1.0E-02	mg/kg-day	2E-01
				1,1,2-Trichloroethane	3.9E-03	mg/L	3.7E-05	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	3E-06	1.1E-04	mg/kg-day	4.0E-03	mg/kg-day	3E-02
				Trichloroethene	7.0E+00	mg/L	6.6E-02	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	6E-04	1.9E-01	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	5.0E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1E-03	1.5E-03	mg/kg-day	3.0E-03	mg/kg-day	5E-01
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	5.4E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	1E-06	1.6E-04	mg/kg-day	2.0E-02	mg/kg-day	8E-03
				Dibenzo(a,h)anthracene ^	1.7E-04	mg/L	3E-07	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	2E-05	4.5E-06	mg/kg-day	NA	--	--
							1E-07	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	3E-06					
							1E-07	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	3E-06					
							6E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	5E-07					
				Indeno(1,2,3-cd)pyrene ^	1.4E-04	mg/L	2E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2E-06	3.9E-06	mg/kg-day	NA	--	--
							1E-07	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	3E-07					
							1E-07	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	2E-07					
							6E-08	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	4E-08					
				Naphthalene	3.4E-04	mg/L	3.2E-06	mg/kg-day	NA	--	--	9.3E-06	mg/kg-day	2.0E-02	mg/kg-day	5E-04
				Total PCB Aroclors	4.4E-03	mg/L	4.2E-05	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	3E-05	1.2E-04	mg/kg-day	2.0E-05	mg/kg-day	6E+00
				gamma-Chlordane	7.5E-04	mg/L	7.0E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	4E-06	2.1E-05	mg/kg-day	5.0E-04	mg/kg-day	4E-02
				4,4'-DDD	2.3E-04	mg/L	2.1E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	8E-07	6.2E-06	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	2.6E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	1E-06	7.5E-06	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	4.6E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-06	1.4E-05	mg/kg-day	5.0E-04	mg/kg-day	3E-02
				Heptachlor	3.6E-03	mg/L	3.3E-05	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	2E-04	9.8E-05	mg/kg-day	5.0E-04	mg/kg-day	2E-01
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	2.5E-10	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	6E-05	7.2E-10	mg/kg-day	1.0E-09	mg/kg-day	7E-01
				Aluminum	2.7E-01	mg/L	2.5E-03	mg/kg-day	NA	--	--	7.3E-03	mg/kg-day	1.0E+00	mg/kg-day	7E-03
				Arsenic	7.6E-02	mg/L	7.1E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-03	2.1E-03	mg/kg-day	3.0E-04	mg/kg-day	7E+00
				Barium	5.4E-01	mg/L	5.1E-03	mg/kg-day	NA	--	--	1.5E-02	mg/kg-day	2.0E-01	mg/kg-day	7E-02
				Cadmium	5.6E-04	mg/L	5.3E-06	mg/kg-day	NA	--	--	1.5E-05	mg/kg-day	5.0E-04	mg/kg-day	3E-02
				Chromium ^	2.3E-03	mg/L	3.6E-06	mg/kg-day	5.0E+00	(mg/kg-day)$^{-1}$	2E-05	6.2E-05	mg/kg-day	3.0E-03	mg/kg-day	2E-02
							1.9E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	3E-06					
							1.6E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-06					
							8.7E-07	mg/kg-day	5.0E-01	(mg/kg-day)$^{-1}$	4E-07					
				Cobalt	4.2E-04	mg/L	3.9E-06	mg/kg-day	NA	--	--	1.1E-05	mg/kg-day	3.0E-04	mg/kg-day	4E-02
				Iron	5.4E-01	mg/L	5.0E-03	mg/kg-day	NA	--	--	1.5E-02	mg/kg-day	7.0E-01	mg/kg-day	2E-02
				Manganese	3.2E-01	mg/L	3.0E-03	mg/kg-day	NA	--	--	8.7E-03	mg/kg-day	2.4E-02	mg/kg-day	4E-01
				Vanadium	7.4E-03	mg/L	7.0E-05	mg/kg-day	NA	--	--	2.0E-04	mg/kg-day	5.0E-03	mg/kg-day	4E-02
			Exposure Route Total								4E-03					2E+02

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Shower	Dermal Absorption	Benzene	7.2E-04	mg/L	N/A	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	4.0E-03	mg/kg-day	N/A
				Bromodichloromethane	4.1E-04	mg/L	N/A	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Chlorobenzene	3.7E-03	mg/L	7.3E-06	mg/kg-day	NA	--	--	2.1E-05	mg/kg-day	2.0E-02	mg/kg-day	1E-03
				Chloroform	2.8E-03	mg/L	N/A	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	1.0E-02	mg/kg-day	N/A
				Dibromochloromethane	3.4E-04	mg/L	N/A	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				1,2-Dichlorobenzene	2.1E-03	mg/L	7.8E-06	mg/kg-day	NA	--	--	2.3E-05	mg/kg-day	9.0E-02	mg/kg-day	3E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	2.7E-05	mg/kg-day	NA	--	--	7.8E-05	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	1.9E-05	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	2E-07	5.4E-05	mg/kg-day	7.0E-02	mg/kg-day	8E-04
				1,1-Dichloroethane	7.0E-04	mg/L	N/A	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-01	mg/kg-day	N/A
				1,2-Dichloroethane	5.6E-04	mg/L	N/A	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				1,1-Dichloroethene	5.7E-03	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	5.0E-02	mg/kg-day	N/A
				cis-1,2-Dichloroethene	1.4E+01	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-03	mg/kg-day	N/A
				trans-1,2-Dichloroethene	6.1E-02	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Methyl tert-butyl ether	1.3E-02	mg/L	N/A	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				Methylene chloride	5.0E-04	mg/L	N/A	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	6.0E-02	mg/kg-day	N/A
				Tetrachloroethene	3.6E-02	mg/L	1.2E-04	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	1E-04	3.5E-04	mg/kg-day	1.0E-02	mg/kg-day	4E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	7.1E-05	mg/kg-day	NA	--	--	2.1E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	4.3E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	2E-05	1.3E-03	mg/kg-day	1.0E-02	mg/kg-day	1E-01
				1,1,2-Trichloroethane	3.9E-03	mg/L	N/A	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	4.0E-03	mg/kg-day	N/A
				Trichloroethene	7.0E+00	mg/L	6.4E-03	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	6E-05	1.9E-02	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	N/A	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	3.0E-03	mg/kg-day	N/A
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	5.3E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	1E-06	1.6E-04	mg/kg-day	2.0E-02	mg/kg-day	8E-03
				Dibenzo(a,h)anthracene ^	1.7E-04	mg/L	2.8E-06	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	2E-04	1.0E-04	mg/kg-day	NA	--	--
							2.4E-06	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	5E-05					
							1.8E-06	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	4E-05					
							1.4E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	1E-05					
				Indeno(1,2,3-cd)pyrene ^	1.4E-04	mg/L	1.7E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	1E-05	6.0E-05	mg/kg-day	NA	--	--
							1.4E-06	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	3E-06					
							1.1E-06	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	2E-06					
							8.5E-07	mg/kg-day	7.3E-01	(mg/kg-day)$^{-1}$	6E-07					
				Naphthalene	3.4E-04	mg/L	1.2E-06	mg/kg-day	NA	--	--	3.6E-06	mg/kg-day	2.0E-02	mg/kg-day	2E-04
				Total PCB Aroclors	4.4E-03	mg/L	5.2E-04	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	3E-04	1.5E-03	mg/kg-day	2.0E-05	mg/kg-day	8E+01
				gamma-Chlordane	7.5E-04	mg/L	1.1E-05	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	6E-06	3.1E-05	mg/kg-day	5.0E-04	mg/kg-day	6E-02
				4,4'-DDD	2.3E-04	mg/L	9.8E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	4E-06	2.9E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	1.0E-05	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	5E-06	3.0E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	3.5E-05	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-05	1.0E-04	mg/kg-day	5.0E-04	mg/kg-day	2E-01
				Heptachlor	3.6E-03	mg/L	1.1E-05	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	7E-05	3.1E-05	mg/kg-day	5.0E-04	mg/kg-day	6E-02
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	3.3E-09	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	8E-04	9.7E-09	mg/kg-day	1.0E-09	mg/kg-day	1E+01
				Aluminum	2.7E-01	mg/L	5.7E-06	mg/kg-day	NA	--	--	1.7E-05	mg/kg-day	1.0E+00	mg/kg-day	2E-05
				Arsenic	7.6E-02	mg/L	1.6E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	4E-06	4.7E-06	mg/kg-day	3.0E-04	mg/kg-day	2E-02
				Barium	5.4E-01	mg/L	1.1E-05	mg/kg-day	NA	--	--	3.4E-05	mg/kg-day	1.4E-02	mg/kg-day	2E-03
				Cadmium	5.6E-04	mg/L	1.2E-08	mg/kg-day	NA	--	--	3.5E-08	mg/kg-day	2.5E-05	mg/kg-day	1E-03
				Chromium ^	2.3E-03	mg/L	7.7E-09	mg/kg-day	2.0E+02	(mg/kg-day)$^{-1}$	2E-06	2.8E-07	mg/kg-day	7.5E-05	mg/kg-day	4E-03
							6.6E-09		6.0E+01		4E-07					
							4.9E-09		6.0E+01		3E-07					
							3.9E-09		2.0E+01		8E-08					
				Cobalt	4.2E-04	mg/L	3.5E-09	mg/kg-day	NA	--	--	1.0E-08	mg/kg-day	3.0E-04	mg/kg-day	3E-05
				Iron	5.4E-01	mg/L	1.1E-05	mg/kg-day	NA	--	--	3.3E-05	mg/kg-day	7.0E-01	mg/kg-day	5E-05
				Manganese	3.2E-01	mg/L	6.7E-06	mg/kg-day	NA	--	--	2.0E-05	mg/kg-day	9.6E-04	mg/kg-day	2E-02
				Vanadium	7.4E-03	mg/L	1.6E-07	mg/kg-day	NA	--	--	4.6E-07	mg/kg-day	1.3E-04	mg/kg-day	4E-03
			Exposure Route Total								2E-03					9E+01

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Bathroom Air	Inhalation	Benzene	4.0E+00	$\mu g/m^3$	3.2E-02	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	4E-07	9.2E-02	$\mu g/m^3$	3.0E+01	$\mu g/m^3$	3E-03
				Bromodichloromethane	2.2E+00	$\mu g/m^3$	1.8E-02	$\mu g/m^3$	3.7E-05	$(\mu g/m^3)^{-1}$	1E-06	5.2E-02	$\mu g/m^3$	NA	--	--
				Chlorobenzene	2.0E+01	$\mu g/m^3$	1.6E-01	$\mu g/m^3$	NA	--	--	4.7E-01	$\mu g/m^3$	5.0E+01	$\mu g/m^3$	9E-03
				Chloroform	1.5E+01	$\mu g/m^3$	1.2E-01	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	5E-06	3.5E-01	$\mu g/m^3$	9.8E+01	$\mu g/m^3$	4E-03
				Dibromochloromethane	1.9E+00	$\mu g/m^3$	1.5E-02	$\mu g/m^3$	2.7E-05	$(\mu g/m^3)^{-1}$	7E-07	4.4E-02	$\mu g/m^3$	NA	--	--
				1,2-Dichlorobenzene	1.2E+01	$\mu g/m^3$	9.4E-02	$\mu g/m^3$	NA	--	--	2.7E-01	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	1E-03
				1,3-Dichlorobenzene	2.9E+01	$\mu g/m^3$	2.3E-01	$\mu g/m^3$	NA	--	--	6.7E-01	$\mu g/m^3$	NA	--	--
				1,4-Dichlorobenzene	2.8E+01	$\mu g/m^3$	2.2E-01	$\mu g/m^3$	1.1E-05	$(\mu g/m^3)^{-1}$	4E-06	6.4E-01	$\mu g/m^3$	8.0E+02	$\mu g/m^3$	8E-04
				1,1-Dichloroethane	3.9E+00	$\mu g/m^3$	3.1E-02	$\mu g/m^3$	1.6E-06	$(\mu g/m^3)^{-1}$	9E-08	8.9E-02	$\mu g/m^3$	NA	--	--
				1,2-Dichloroethane	3.1E+00	$\mu g/m^3$	2.4E-02	$\mu g/m^3$	2.6E-05	$(\mu g/m^3)^{-1}$	1E-06	7.1E-02	$\mu g/m^3$	7.0E+00	$\mu g/m^3$	1E-02
				1,1-Dichloroethene	3.2E+01	$\mu g/m^3$	2.5E-01	$\mu g/m^3$	NA	--	--	7.3E-01	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	4E-03
				cis-1,2-Dichloroethene	7.8E+04	$\mu g/m^3$	6.2E+02	$\mu g/m^3$	NA	--	--	1.8E+03	$\mu g/m^3$	NA	--	--
				trans-1,2-Dichloroethene	3.4E+02	$\mu g/m^3$	2.7E+00	$\mu g/m^3$	NA	--	--	7.8E+00	$\mu g/m^3$	6.0E+01	$\mu g/m^3$	1E-01
				Methyl tert-butyl ether	6.9E+01	$\mu g/m^3$	5.5E-01	$\mu g/m^3$	2.6E-07	$(\mu g/m^3)^{-1}$	3E-07	1.6E+00	$\mu g/m^3$	3.0E+03	$\mu g/m^3$	5E-04
				Methylene chloride	2.8E+00	$\mu g/m^3$	2.2E-02	$\mu g/m^3$	4.7E-07	$(\mu g/m^3)^{-1}$	2E-08	6.4E-02	$\mu g/m^3$	1.0E+03	$\mu g/m^3$	6E-05
				Tetrachloroethene	2.0E+02	$\mu g/m^3$	1.6E+00	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	2E-05	4.6E+00	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	2E-02
				1,2,3-Trichlorobenzene	4.7E+01	$\mu g/m^3$	3.7E-01	$\mu g/m^3$	NA	--	--	1.1E+00	$\mu g/m^3$	NA	--	--
				1,2,4-Trichlorobenzene	3.2E+02	$\mu g/m^3$	2.6E+00	$\mu g/m^3$	NA	--	--	7.5E+00	$\mu g/m^3$	2.0E+00	$\mu g/m^3$	4E+00
				1,1,2-Trichloroethane	2.2E+01	$\mu g/m^3$	1.7E-01	$\mu g/m^3$	1.6E-05	$(\mu g/m^3)^{-1}$	5E-06	5.0E-01	$\mu g/m^3$	NA	--	--
				Trichloroethene	3.9E+04	$\mu g/m^3$	3.1E+02	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	1E-03	9.0E+02	$\mu g/m^3$	NA	--	--
				Vinyl chloride	2.9E+02	$\mu g/m^3$	2.3E+00	$\mu g/m^3$	8.8E-06	$(\mu g/m^3)^{-1}$	4E-05	6.8E+00	$\mu g/m^3$	1.0E+02	$\mu g/m^3$	7E-02
				Naphthalene	1.9E+00	$\mu g/m^3$	1.5E-02	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	9E-07	4.4E-02	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	1E-02
			Exposure Route Total								1E-03					4E+00
		Exposure Point Total									7E-03					3E+02
	Total of Receptor Risks Across Medium										7E-03					3E+02

Notes

Cancer risks for the resident adult were calculated as 6 years at the child's rate of exposure and 24 years at the adult's rate of exposure.

^ To calculate cancer risks for these carcinogenic COPCs with a mutagenic mode of action, age-dependent adjustment factors (ADAF) were applied to the cancer slope factors. For the resident adult, an ADAF of 10 was used to evaluate exposure between the ages of 0-2; an ADAF of 3 was used to evaluate exposure between the ages of 2-6 and 6-16; no adjustment was made to evaluate exposure between the ages of 16-30. To facilitate application of the ADAFs, intakes and dermally absorbed doses were calculated for each of the corresponding age groups, and the appropriate ADAF was applied to the cancer slope factor.

N/A - Not Applicable

NA - Not Available

TABLE 7.5.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Tap Water	Ingestion	Benzene	7.2E-04	mg/L	1.3E-06	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	7E-08	9.9E-06	mg/kg-day	4.0E-03	mg/kg-day	2E-03
				Bromodichloromethane	4.1E-04	mg/L	7.2E-07	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	4E-08	5.6E-06	mg/kg-day	2.0E-02	mg/kg-day	3E-04
				Chlorobenzene	3.7E-03	mg/L	6.5E-06	mg/kg-day	NA	--	--	5.1E-05	mg/kg-day	2.0E-02	mg/kg-day	3E-03
				Chloroform	2.8E-03	mg/L	4.9E-06	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	2E-07	3.8E-05	mg/kg-day	1.0E-02	mg/kg-day	4E-03
				Dibromochloromethane	3.4E-04	mg/L	6.0E-07	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	5E-08	4.7E-06	mg/kg-day	2.0E-02	mg/kg-day	2E-04
				1,2-Dichlorobenzene	2.1E-03	mg/L	3.8E-06	mg/kg-day	NA	--	--	2.9E-05	mg/kg-day	9.0E-02	mg/kg-day	3E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	9.2E-06	mg/kg-day	NA	--	--	7.2E-05	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	8.8E-06	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	5E-08	6.9E-05	mg/kg-day	7.0E-02	mg/kg-day	1E-03
				1,1-Dichloroethane	7.0E-04	mg/L	1.2E-06	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	7E-09	9.6E-06	mg/kg-day	2.0E-01	mg/kg-day	5E-05
				1,2-Dichloroethane	5.6E-04	mg/L	9.8E-07	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	9E-08	7.6E-06	mg/kg-day	NA	--	--
				1,1-Dichloroethene	5.7E-03	mg/L	1.0E-05	mg/kg-day	NA	--	--	7.8E-05	mg/kg-day	5.0E-02	mg/kg-day	2E-03
				cis-1,2-Dichloroethene	1.4E+01	mg/L	2.5E-02	mg/kg-day	NA	--	--	1.9E-01	mg/kg-day	2.0E-03	mg/kg-day	1E+02
				trans-1,2-Dichloroethene	6.1E-02	mg/L	1.1E-04	mg/kg-day	NA	--	--	8.3E-04	mg/kg-day	2.0E-02	mg/kg-day	4E-02
				Methyl tert-butyl ether	1.3E-02	mg/L	2.2E-05	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	4E-08	1.7E-04	mg/kg-day	NA	--	--
				Methylene chloride	5.0E-04	mg/L	8.9E-07	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	7E-09	6.9E-06	mg/kg-day	6.0E-02	mg/kg-day	1E-04
				Tetrachloroethene	3.6E-02	mg/L	6.3E-05	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	3E-05	4.9E-04	mg/kg-day	1.0E-02	mg/kg-day	5E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	1.5E-05	mg/kg-day	NA	--	--	1.2E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	1.0E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	3E-06	8.0E-04	mg/kg-day	1.0E-02	mg/kg-day	8E-02
				1,1,2-Trichloroethane	3.9E-03	mg/L	6.9E-06	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	4E-07	5.3E-05	mg/kg-day	4.0E-03	mg/kg-day	1E-02
				Trichloroethene	7.0E+00	mg/L	1.2E-02	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	7E-05	9.6E-02	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	9.4E-05	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1E-04	7.3E-04	mg/kg-day	3.0E-03	mg/kg-day	2E-01
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	1.0E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	1E-07	7.9E-05	mg/kg-day	2.0E-02	mg/kg-day	4E-03
				Dibenzo(a,h)anthracene	1.7E-04	mg/L	3.1E-08	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	2E-06	2.3E-06	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	1.4E-04	mg/L	2.7E-08	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2E-07	2.0E-06	mg/kg-day	NA	--	--
				Naphthalene	3.4E-04	mg/L	6.0E-07	mg/kg-day	NA	--	--	4.7E-06	mg/kg-day	2.0E-02	mg/kg-day	2E-04
				Total PCB Aroclors	4.4E-03	mg/L	7.8E-06	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	3E-06	6.1E-05	mg/kg-day	2.0E-05	mg/kg-day	3E+00
				gamma-Chlordane	7.5E-04	mg/L	1.3E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	5E-07	1.0E-05	mg/kg-day	5.0E-04	mg/kg-day	2E-02
				4,4'-DDD	2.3E-04	mg/L	4.0E-07	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	1E-07	3.1E-06	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	4.8E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-07	3.8E-06	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	8.7E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	3E-07	6.8E-06	mg/kg-day	5.0E-04	mg/kg-day	1E-02
				Heptachlor	3.6E-03	mg/L	6.3E-06	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	3E-05	4.9E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	4.6E-11	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	7E-06	3.6E-10	mg/kg-day	1.0E-09	mg/kg-day	4E-01
				Aluminum	2.7E-01	mg/L	4.7E-04	mg/kg-day	NA	--	--	3.7E-03	mg/kg-day	1.0E+00	mg/kg-day	4E-03
				Arsenic	7.6E-02	mg/L	1.3E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-04	1.0E-03	mg/kg-day	3.0E-04	mg/kg-day	3E+00
				Barium	5.4E-01	mg/L	9.6E-04	mg/kg-day	NA	--	--	7.5E-03	mg/kg-day	2.0E-01	mg/kg-day	4E-02
				Cadmium	5.6E-04	mg/L	9.9E-07	mg/kg-day	NA	--	--	7.7E-06	mg/kg-day	5.0E-04	mg/kg-day	2E-02
				Chromium	2.3E-03	mg/L	4.3E-07	mg/kg-day	5.0E+00	(mg/kg-day)$^{-1}$	2E-06	3.1E-05	mg/kg-day	3.0E-03	mg/kg-day	1E-02
				Cobalt	4.2E-04	mg/L	7.4E-07	mg/kg-day	NA	--	--	5.7E-06	mg/kg-day	3.0E-04	mg/kg-day	2E-02
				Iron	5.4E-01	mg/L	9.5E-04	mg/kg-day	NA	--	--	7.4E-03	mg/kg-day	7.0E-01	mg/kg-day	1E-02
				Manganese	3.2E-01	mg/L	5.6E-04	mg/kg-day	NA	--	--	4.4E-03	mg/kg-day	2.4E-02	mg/kg-day	2E-01
				Vanadium	7.4E-03	mg/L	1.3E-05	mg/kg-day	NA	--	--	1.0E-04	mg/kg-day	5.0E-03	mg/kg-day	2E-02
			Exposure Route Total								5E-04					1E+02

TABLE 7.5.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Shower	Dermal Absorption	Benzene	7.2E-04	mg/L	8.5E-08	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	5E-09	1.5E-06	mg/kg-day	4.0E-03	mg/kg-day	4E-04
				Bromodichloromethane	4.1E-04	mg/L	N/A	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Chlorobenzene	3.7E-03	mg/L	9.9E-07	mg/kg-day	NA	--	--	7.7E-06	mg/kg-day	2.0E-02	mg/kg-day	4E-04
				Chloroform	2.8E-03	mg/L	N/A	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	1.0E-02	mg/kg-day	N/A
				Dibromochloromethane	3.4E-04	mg/L	N/A	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				1,2-Dichlorobenzene	2.1E-03	mg/L	1.1E-06	mg/kg-day	NA	--	--	8.5E-06	mg/kg-day	9.0E-02	mg/kg-day	9E-05
				1,3-Dichlorobenzene	5.2E-03	mg/L	3.7E-06	mg/kg-day	NA	--	--	2.9E-05	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	2.5E-06	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	1E-08	2.0E-05	mg/kg-day	7.0E-02	mg/kg-day	3E-04
				1,1-Dichloroethane	7.0E-04	mg/L	N/A	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-01	mg/kg-day	N/A
				1,2-Dichloroethane	5.6E-04	mg/L	N/A	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				1,1-Dichloroethene	5.7E-03	mg/L	5.9E-07	mg/kg-day	NA	--	--	4.6E-06	mg/kg-day	5.0E-02	mg/kg-day	9E-05
				cis-1,2-Dichloroethene	1.4E+01	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-03	mg/kg-day	N/A
				trans-1,2-Dichloroethene	6.1E-02	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Methyl tert-butyl ether	1.3E-02	mg/L	N/A	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				Methylene chloride	5.0E-04	mg/L	N/A	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	6.0E-02	mg/kg-day	N/A
				Tetrachloroethene	3.6E-02	mg/L	1.7E-05	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	9E-06	1.3E-04	mg/kg-day	1.0E-02	mg/kg-day	1E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	9.6E-06	mg/kg-day	NA	--	--	7.5E-05	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	5.9E-05	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	2E-06	4.6E-04	mg/kg-day	1.0E-02	mg/kg-day	5E-02
				1,1,2-Trichloroethane	3.9E-03	mg/L	N/A	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	4.0E-03	mg/kg-day	N/A
				Trichloroethene	7.0E+00	mg/L	9.0E-04	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	5E-06	7.0E-03	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	N/A	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	3.0E-03	mg/kg-day	N/A
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	1.4E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	2E-07	1.1E-04	mg/kg-day	2.0E-02	mg/kg-day	5E-03
				Dibenzo(a,h)anthracene	1.7E-04	mg/L	9.2E-07	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	7E-05	6.5E-05	mg/kg-day	NA	--	--
				Indeno(1,2,3-cd)pyrene	1.4E-04	mg/L	5.5E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	4E-06	3.9E-05	mg/kg-day	NA	--	--
				Naphthalene	3.4E-04	mg/L	1.7E-07	mg/kg-day	NA	--	--	1.3E-06	mg/kg-day	2.0E-02	mg/kg-day	7E-05
				Total PCB Aroclors	4.4E-03	mg/L	1.3E-04	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	5E-05	1.0E-03	mg/kg-day	2.0E-05	mg/kg-day	5E+01
				gamma-Chlordane	7.5E-04	mg/L	2.6E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	9E-07	2.0E-05	mg/kg-day	5.0E-04	mg/kg-day	4E-02
				4,4'-DDD	2.3E-04	mg/L	2.5E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	6E-07	1.9E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	2.5E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	9E-07	2.0E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	8.8E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	3E-06	6.8E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				Heptachlor	3.6E-03	mg/L	2.6E-06	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	1E-05	2.0E-05	mg/kg-day	5.0E-04	mg/kg-day	4E-02
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	8.0E-10	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	1E-04	6.2E-09	mg/kg-day	1.0E-09	mg/kg-day	6E+00
				Aluminum	2.7E-01	mg/L	9.3E-07	mg/kg-day	NA	--	--	7.3E-06	mg/kg-day	1.0E+00	mg/kg-day	7E-06
				Arsenic	7.6E-02	mg/L	2.7E-07	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	4E-07	2.1E-06	mg/kg-day	3.0E-04	mg/kg-day	7E-03
				Barium	5.4E-01	mg/L	1.9E-06	mg/kg-day	NA	--	--	1.5E-05	mg/kg-day	1.4E-02	mg/kg-day	1E-03
				Cadmium	5.6E-04	mg/L	2.0E-09	mg/kg-day	NA	--	--	1.5E-08	mg/kg-day	2.5E-05	mg/kg-day	6E-04
				Chromium	2.3E-03	mg/L	1.7E-09	mg/kg-day	2.0E+02	(mg/kg-day)$^{-1}$	3E-07	1.2E-07	mg/kg-day	7.5E-05	mg/kg-day	2E-03
				Cobalt	4.2E-04	mg/L	5.8E-10	mg/kg-day	NA	--	--	4.5E-09	mg/kg-day	3.0E-04	mg/kg-day	2E-05
				Iron	5.4E-01	mg/L	1.9E-06	mg/kg-day	NA	--	--	1.5E-05	mg/kg-day	7.0E-01	mg/kg-day	2E-05
				Manganese	3.2E-01	mg/L	1.1E-06	mg/kg-day	NA	--	--	8.6E-06	mg/kg-day	9.6E-04	mg/kg-day	9E-03
				Vanadium	7.4E-03	mg/L	2.6E-08	mg/kg-day	NA	--	--	2.0E-07	mg/kg-day	1.3E-04	mg/kg-day	2E-03
			Exposure Route Total								3E-04					6E+01

TABLE 7.5.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Bathroom Air	Inhalation	Benzene	1.7E+00	$\mu g/m^3$	2.2E-03	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	2E-08	1.7E-02	$\mu g/m^3$	3.0E+01	$\mu g/m^3$	6E-04
				Bromodichloromethane	9.8E-01	$\mu g/m^3$	1.3E-03	$\mu g/m^3$	3.7E-05	$(\mu g/m^3)^{-1}$	5E-08	9.8E-03	$\mu g/m^3$	NA	--	--
				Chlorobenzene	8.9E+00	$\mu g/m^3$	1.1E-02	$\mu g/m^3$	NA	--	--	8.9E-02	$\mu g/m^3$	5.0E+01	$\mu g/m^3$	2E-03
				Chloroform	6.7E+00	$\mu g/m^3$	8.6E-03	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	2E-07	6.7E-02	$\mu g/m^3$	9.8E+01	$\mu g/m^3$	7E-04
				Dibromochloromethane	8.3E-01	$\mu g/m^3$	1.1E-03	$\mu g/m^3$	2.7E-05	$(\mu g/m^3)^{-1}$	3E-08	8.3E-03	$\mu g/m^3$	NA	--	--
				1,2-Dichlorobenzene	5.2E+00	$\mu g/m^3$	6.7E-03	$\mu g/m^3$	NA	--	--	5.2E-02	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	3E-04
				1,3-Dichlorobenzene	1.3E+01	$\mu g/m^3$	1.6E-02	$\mu g/m^3$	NA	--	--	1.3E-01	$\mu g/m^3$	NA	--	--
				1,4-Dichlorobenzene	1.2E+01	$\mu g/m^3$	1.6E-02	$\mu g/m^3$	1.1E-05	$(\mu g/m^3)^{-1}$	2E-07	1.2E-01	$\mu g/m^3$	8.0E+02	$\mu g/m^3$	2E-04
				1,1-Dichloroethane	1.7E+00	$\mu g/m^3$	2.2E-03	$\mu g/m^3$	1.6E-06	$(\mu g/m^3)^{-1}$	3E-09	1.7E-02	$\mu g/m^3$	NA	--	--
				1,2-Dichloroethane	1.3E+00	$\mu g/m^3$	1.7E-03	$\mu g/m^3$	2.6E-05	$(\mu g/m^3)^{-1}$	4E-08	1.3E-02	$\mu g/m^3$	7.0E+00	$\mu g/m^3$	2E-03
				1,1-Dichloroethene	1.4E+01	$\mu g/m^3$	1.8E-02	$\mu g/m^3$	NA	--	--	1.4E-01	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	7E-04
				cis-1,2-Dichloroethene	3.4E+04	$\mu g/m^3$	4.4E+01	$\mu g/m^3$	NA	--	--	3.4E+02	$\mu g/m^3$	NA	--	--
				trans-1,2-Dichloroethene	1.5E+02	$\mu g/m^3$	1.9E-01	$\mu g/m^3$	NA	--	--	1.5E+00	$\mu g/m^3$	6.0E+01	$\mu g/m^3$	2E-02
				Methyl tert-butyl ether	3.0E+01	$\mu g/m^3$	3.9E-02	$\mu g/m^3$	2.6E-07	$(\mu g/m^3)^{-1}$	1E-08	3.0E-01	$\mu g/m^3$	3.0E+03	$\mu g/m^3$	1E-04
				Methylene chloride	1.2E+00	$\mu g/m^3$	1.6E-03	$\mu g/m^3$	4.7E-07	$(\mu g/m^3)^{-1}$	7E-10	1.2E-02	$\mu g/m^3$	1.0E+03	$\mu g/m^3$	1E-05
				Tetrachloroethene	8.7E+01	$\mu g/m^3$	1.1E-01	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	7E-07	8.7E-01	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	3E-03
				1,2,3-Trichlorobenzene	2.0E+01	$\mu g/m^3$	2.6E-02	$\mu g/m^3$	NA	--	--	2.0E-01	$\mu g/m^3$	NA	--	--
				1,2,4-Trichlorobenzene	1.4E+02	$\mu g/m^3$	1.8E-01	$\mu g/m^3$	NA	--	--	1.4E+00	$\mu g/m^3$	2.0E+00	$\mu g/m^3$	7E-01
				1,1,2-Trichloroethane	9.4E+00	$\mu g/m^3$	1.2E-02	$\mu g/m^3$	1.6E-05	$(\mu g/m^3)^{-1}$	2E-07	9.4E-02	$\mu g/m^3$	NA	--	--
				Trichloroethene	1.7E+04	$\mu g/m^3$	2.2E+01	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	4E-05	1.7E+02	$\mu g/m^3$	NA	--	--
				Vinyl chloride	1.3E+02	$\mu g/m^3$	1.6E-01	$\mu g/m^3$	8.8E-06	$(\mu g/m^3)^{-1}$	1E-06	1.3E+00	$\mu g/m^3$	1.0E+02	$\mu g/m^3$	1E-02
				Naphthalene	8.2E-01	$\mu g/m^3$	1.1E-03	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	4E-08	8.2E-03	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	3E-03
			Exposure Route Total								5E-05					8E-01
		Exposure Point Total									8E-04					2E+02
	Total of Receptor Risks Across Medium										8E-04					2E+02

Notes
Cancer risks for the resident adult were calculated as 9 years at the adult's rate of exposure.
N/A - Not Applicable
NA - Not Available

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Tap Water	Ingestion	Benzene	7.2E-04	mg/L	4E-06	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	2E-07	5E-05	mg/kg-day	4.0E-03	mg/kg-day	1E-02
				Bromodichloromethane	4.1E-04	mg/L	2E-06	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	1E-07	3E-05	mg/kg-day	2.0E-02	mg/kg-day	1E-03
				Chlorobenzene	3.7E-03	mg/L	2E-05	mg/kg-day	NA	--	--	2E-04	mg/kg-day	2.0E-02	mg/kg-day	1E-02
				Chloroform	2.8E-03	mg/L	2E-05	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	5E-07	2E-04	mg/kg-day	1.0E-02	mg/kg-day	2E-02
				Dibromochloromethane	3.4E-04	mg/L	2E-06	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	2E-07	2E-05	mg/kg-day	2.0E-02	mg/kg-day	1E-03
				1,2-Dichlorobenzene	2.1E-03	mg/L	1E-05	mg/kg-day	NA	--	--	1E-04	mg/kg-day	9.0E-02	mg/kg-day	2E-03
				1,3-Dichlorobenzene	5.2E-03	mg/L	3E-05	mg/kg-day	NA	--	--	3E-04	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	3E-05	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	1E-07	3E-04	mg/kg-day	7.0E-02	mg/kg-day	5E-03
				1,1-Dichloroethane	7.0E-04	mg/L	4E-06	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	2E-08	4E-05	mg/kg-day	2.0E-01	mg/kg-day	2E-04
				1,2-Dichloroethane	5.6E-04	mg/L	3E-06	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	3E-07	4E-05	mg/kg-day	NA	--	--
				1,1-Dichloroethene	5.7E-03	mg/L	3E-05	mg/kg-day	NA	--	--	4E-04	mg/kg-day	5.0E-02	mg/kg-day	7E-03
				cis-1,2-Dichloroethene	1.4E+01	mg/L	8E-02	mg/kg-day	NA	--	--	9E-01	mg/kg-day	2.0E-03	mg/kg-day	5E+02
				trans-1,2-Dichloroethene	6.1E-02	mg/L	3E-04	mg/kg-day	NA	--	--	4E-03	mg/kg-day	2.0E-02	mg/kg-day	2E-01
				Methyl tert-butyl ether	1.3E-02	mg/L	7E-05	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	1E-07	8E-04	mg/kg-day	NA	--	--
				Methylene chloride	5.0E-04	mg/L	3E-06	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	2E-08	3E-05	mg/kg-day	6.0E-02	mg/kg-day	5E-04
				Tetrachloroethene	3.6E-02	mg/L	2E-04	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	1E-04	2E-03	mg/kg-day	1.0E-02	mg/kg-day	2E-01
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	5E-05	mg/kg-day	NA	--	--	5E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	3E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	9E-06	4E-03	mg/kg-day	1.0E-02	mg/kg-day	4E-01
				1,1,2-Trichloroethane	3.9E-03	mg/L	2E-05	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	1E-06	2E-04	mg/kg-day	4.0E-03	mg/kg-day	6E-02
				Trichloroethene	7.0E+00	mg/L	4E-02	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	2E-04	5E-01	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	3E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	4E-04	3E-03	mg/kg-day	3.0E-03	mg/kg-day	1E+00
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	3E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	4E-07	4E-04	mg/kg-day	2.0E-02	mg/kg-day	2E-02
				Dibenzo(a,h)anthracene ^	1.7E-04	mg/L	3E-07	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	2E-05	1E-05	mg/kg-day	NA	--	--
							1E-07	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	3E-06					
				Indeno(1,2,3-cd)pyrene ^	1.4E-04	mg/L	2E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2E-06	9E-06	mg/kg-day	NA	--	--
							1E-07	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	3E-07					
				Naphthalene	3.4E-04	mg/L	2E-06	mg/kg-day	NA	--	--	2E-05	mg/kg-day	2.0E-02	mg/kg-day	1E-03
				Total PCB Aroclors	4.4E-03	mg/L	2E-05	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	1E-05	3E-04	mg/kg-day	2.0E-05	mg/kg-day	1E+01
				gamma-Chlordane	7.5E-04	mg/L	4E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	1E-06	5E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				4,4'-DDD	2.3E-04	mg/L	1E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	3E-07	1E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	2E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	5E-07	2E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	3E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	9E-07	3E-05	mg/kg-day	5.0E-04	mg/kg-day	6E-02
				Heptachlor	3.6E-03	mg/L	2E-05	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	9E-05	2E-04	mg/kg-day	5.0E-04	mg/kg-day	5E-01
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	1E-10	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	2E-05	2E-09	mg/kg-day	1.0E-09	mg/kg-day	2E+00
				Aluminum	2.7E-01	mg/L	1E-03	mg/kg-day	NA	--	--	2E-02	mg/kg-day	1.0E+00	mg/kg-day	2E-02
				Arsenic	7.6E-02	mg/L	4E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	6E-04	5E-03	mg/kg-day	3.0E-04	mg/kg-day	2E+01
				Barium	5.4E-01	mg/L	3E-03	mg/kg-day	NA	--	--	3E-02	mg/kg-day	2.0E-01	mg/kg-day	2E-01
				Cadmium	5.6E-04	mg/L	3E-06	mg/kg-day	NA	--	--	4E-05	mg/kg-day	5.0E-04	mg/kg-day	7E-02
				Chromium ^	2.3E-03	mg/L	4E-06	mg/kg-day	5.0E+00	(mg/kg-day)$^{-1}$	2E-05	1E-04	mg/kg-day	3.0E-03	mg/kg-day	5E-02
							2E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	3E-06					
				Cobalt	4.2E-04	mg/L	2E-06	mg/kg-day	NA	--	--	3E-05	mg/kg-day	3.0E-04	mg/kg-day	9E-02
				Iron	5.4E-01	mg/L	3E-03	mg/kg-day	NA	--	--	3E-02	mg/kg-day	7.0E-01	mg/kg-day	5E-02
				Manganese	3.2E-01	mg/L	2E-03	mg/kg-day	NA	--	--	2E-02	mg/kg-day	2.4E-02	mg/kg-day	8E-01
				Vanadium	7.4E-03	mg/L	4E-05	mg/kg-day	NA	--	--	5E-04	mg/kg-day	5.0E-03	mg/kg-day	9E-02
			Exposure Route Total								2E-03					5E+02

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Shower	Dermal Absorption	Benzene	7.2E-04	mg/L	N/A	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	4.0E-03	mg/kg-day	N/A
				Bromodichloromethane	4.1E-04	mg/L	N/A	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Chlorobenzene	3.7E-03	mg/L	4E-06	mg/kg-day	NA	--	--	5E-05	mg/kg-day	2.0E-02	mg/kg-day	2E-03
				Chloroform	2.8E-03	mg/L	N/A	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	1.0E-02	mg/kg-day	N/A
				Dibromochloromethane	3.4E-04	mg/L	N/A	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				1,2-Dichlorobenzene	2.1E-03	mg/L	5E-06	mg/kg-day	NA	--	--	5E-05	mg/kg-day	9.0E-02	mg/kg-day	6E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	2E-05	mg/kg-day	NA	--	--	2E-04	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	1E-05	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	6E-08	1E-04	mg/kg-day	7.0E-02	mg/kg-day	2E-03
				1,1-Dichloroethane	7.0E-04	mg/L	N/A	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-01	mg/kg-day	N/A
				1,2-Dichloroethane	5.6E-04	mg/L	N/A	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				1,1-Dichloroethene	5.7E-03	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	5.0E-02	mg/kg-day	N/A
				cis-1,2-Dichloroethene	1.4E+01	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-03	mg/kg-day	N/A
				trans-1,2-Dichloroethene	6.1E-02	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Methyl tert-butyl ether	1.3E-02	mg/L	N/A	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				Methylene chloride	5.0E-04	mg/L	N/A	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	6.0E-02	mg/kg-day	N/A
				Tetrachloroethene	3.6E-02	mg/L	7E-05	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	4E-05	8E-04	mg/kg-day	1.0E-02	mg/kg-day	8E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	4E-05	mg/kg-day	NA	--	--	4E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	2E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	7E-06	3E-03	mg/kg-day	1.0E-02	mg/kg-day	3E-01
				1,1,2-Trichloroethane	3.9E-03	mg/L	N/A	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	4.0E-03	mg/kg-day	N/A
				Trichloroethene	7.0E+00	mg/L	4E-03	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	2E-05	4E-02	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	N/A	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	3.0E-03	mg/kg-day	N/A
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	3E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	4E-07	4E-04	mg/kg-day	2.0E-02	mg/kg-day	2E-02
				Dibenzo(a,h)anthracene ^	1.7E-04	mg/L	4E-06	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	3E-04	2E-04	mg/kg-day	NA	--	--
							3E-06	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	7E-05					
				Indeno(1,2,3-cd)pyrene ^	1.4E-04	mg/L	2E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	2E-05	1E-04	mg/kg-day	NA	--	--
							2E-06	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	4E-06					
				Naphthalene	3.4E-04	mg/L	7E-07	mg/kg-day	NA	--	--	8E-06	mg/kg-day	2.0E-02	mg/kg-day	4E-04
				Total PCB Aroclors	4.4E-03	mg/L	3E-04	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	1E-04	4E-03	mg/kg-day	2.0E-05	mg/kg-day	2E+02
				gamma-Chlordane	7.5E-04	mg/L	6E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	2E-06	7E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				4,4'-DDD	2.3E-04	mg/L	6E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	1E-06	7E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	6E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	2E-06	7E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	2E-05	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	7E-06	2E-04	mg/kg-day	5.0E-04	mg/kg-day	5E-01
				Heptachlor	3.6E-03	mg/L	6E-06	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	3E-05	7E-05	mg/kg-day	5.0E-04	mg/kg-day	1E-01
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	2E-09	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	3E-04	2E-08	mg/kg-day	1.0E-09	mg/kg-day	2E+01
				Aluminum	2.7E-01	mg/L	4E-06	mg/kg-day	NA	--	--	5E-05	mg/kg-day	1.0E+00	mg/kg-day	5E-05
				Arsenic	7.6E-02	mg/L	1E-06	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-06	1E-05	mg/kg-day	3.0E-04	mg/kg-day	5E-02
				Barium	5.4E-01	mg/L	9E-06	mg/kg-day	NA	--	--	1E-04	mg/kg-day	1.4E-02	mg/kg-day	7E-03
				Cadmium	5.6E-04	mg/L	9E-09	mg/kg-day	NA	--	--	1E-07	mg/kg-day	2.5E-05	mg/kg-day	4E-03
				Chromium ^	2.3E-03	mg/L	1E-08	mg/kg-day	2.0E+02	(mg/kg-day)$^{-1}$	3E-06	9E-07	mg/kg-day	7.5E-05	mg/kg-day	1E-02
							1E-08		6.0E+01		7E-07					
				Cobalt	4.2E-04	mg/L	3E-09	mg/kg-day	NA	--	--	3E-08	mg/kg-day	3.0E-04	mg/kg-day	1E-04
				Iron	5.4E-01	mg/L	9E-06	mg/kg-day	NA	--	--	1E-04	mg/kg-day	7.0E-01	mg/kg-day	1E-04
				Manganese	3.2E-01	mg/L	5E-06	mg/kg-day	NA	--	--	6E-05	mg/kg-day	9.6E-04	mg/kg-day	6E-02
				Vanadium	7.4E-03	mg/L	1E-07	mg/kg-day	NA	--	--	1E-06	mg/kg-day	1.3E-04	mg/kg-day	1E-02
			Exposure Route Total								9E-04					2E+02

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Bathroom Air	Inhalation	Benzene	7.1E+00	$\mu g/m^3$	2E-02	$\mu g/m^3$	7.8E-06	$(\mu g/m^3)^{-1}$	2E-07	3E-01	$\mu g/m^3$	3.0E+01	$\mu g/m^3$	9E-03
				Bromodichloromethane	4.0E+00	$\mu g/m^3$	1E-02	$\mu g/m^3$	3.7E-05	$(\mu g/m^3)^{-1}$	5E-07	2E-01	$\mu g/m^3$	NA	--	--
				Chlorobenzene	3.6E+01	$\mu g/m^3$	1E-01	$\mu g/m^3$	NA	--	--	1E+00	$\mu g/m^3$	5.0E+01	$\mu g/m^3$	3E-02
				Chloroform	2.7E+01	$\mu g/m^3$	9E-02	$\mu g/m^3$	2.3E-05	$(\mu g/m^3)^{-1}$	2E-06	1E+00	$\mu g/m^3$	9.8E+01	$\mu g/m^3$	1E-02
				Dibromochloromethane	3.4E+00	$\mu g/m^3$	1E-02	$\mu g/m^3$	2.7E-05	$(\mu g/m^3)^{-1}$	3E-07	1E-01	$\mu g/m^3$	NA	--	--
				1,2-Dichlorobenzene	2.1E+01	$\mu g/m^3$	7E-02	$\mu g/m^3$	NA	--	--	8E-01	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	4E-03
				1,3-Dichlorobenzene	5.1E+01	$\mu g/m^3$	2E-01	$\mu g/m^3$	NA	--	--	2E+00	$\mu g/m^3$	NA	--	--
				1,4-Dichlorobenzene	4.9E+01	$\mu g/m^3$	2E-01	$\mu g/m^3$	1.1E-05	$(\mu g/m^3)^{-1}$	2E-06	2E+00	$\mu g/m^3$	8.0E+02	$\mu g/m^3$	2E-03
				1,1-Dichloroethane	6.9E+00	$\mu g/m^3$	2E-02	$\mu g/m^3$	1.6E-06	$(\mu g/m^3)^{-1}$	4E-08	3E-01	$\mu g/m^3$	NA	--	--
				1,2-Dichloroethane	5.4E+00	$\mu g/m^3$	2E-02	$\mu g/m^3$	2.6E-05	$(\mu g/m^3)^{-1}$	5E-07	2E-01	$\mu g/m^3$	7.0E+00	$\mu g/m^3$	3E-02
				1,1-Dichloroethene	5.6E+01	$\mu g/m^3$	2E-01	$\mu g/m^3$	NA	--	--	2E+00	$\mu g/m^3$	2.0E+02	$\mu g/m^3$	1E-02
				cis-1,2-Dichloroethene	1.4E+05	$\mu g/m^3$	5E+02	$\mu g/m^3$	NA	--	--	6E+03	$\mu g/m^3$	NA	--	--
				trans-1,2-Dichloroethene	6.0E+02	$\mu g/m^3$	2E+00	$\mu g/m^3$	NA	--	--	2E+01	$\mu g/m^3$	6.0E+01	$\mu g/m^3$	4E-01
				Methyl tert-butyl ether	1.2E+02	$\mu g/m^3$	4E-01	$\mu g/m^3$	2.6E-07	$(\mu g/m^3)^{-1}$	1E-07	5E+00	$\mu g/m^3$	3.0E+03	$\mu g/m^3$	2E-03
				Methylene chloride	4.9E+00	$\mu g/m^3$	2E-02	$\mu g/m^3$	4.7E-07	$(\mu g/m^3)^{-1}$	8E-09	2E-01	$\mu g/m^3$	1.0E+03	$\mu g/m^3$	2E-04
				Tetrachloroethene	3.5E+02	$\mu g/m^3$	1E+00	$\mu g/m^3$	5.9E-06	$(\mu g/m^3)^{-1}$	7E-06	1E+01	$\mu g/m^3$	2.7E+02	$\mu g/m^3$	5E-02
				1,2,3-Trichlorobenzene	8.3E+01	$\mu g/m^3$	3E-01	$\mu g/m^3$	NA	--	--	3E+00	$\mu g/m^3$	NA	--	--
				1,2,4-Trichlorobenzene	5.7E+02	$\mu g/m^3$	2E+00	$\mu g/m^3$	NA	--	--	2E+01	$\mu g/m^3$	2.0E+00	$\mu g/m^3$	1E+01
				1,1,2-Trichloroethane	3.8E+01	$\mu g/m^3$	1E-01	$\mu g/m^3$	1.6E-05	$(\mu g/m^3)^{-1}$	2E-06	2E+00	$\mu g/m^3$	NA	--	--
				Trichloroethene	6.9E+04	$\mu g/m^3$	2E+02	$\mu g/m^3$	2.0E-06	$(\mu g/m^3)^{-1}$	5E-04	3E+03	$\mu g/m^3$	NA	--	--
				Vinyl chloride	5.2E+02	$\mu g/m^3$	2E+00	$\mu g/m^3$	8.8E-06	$(\mu g/m^3)^{-1}$	2E-05	2E+01	$\mu g/m^3$	1.0E+02	$\mu g/m^3$	2E-01
				Naphthalene	3.3E+00	$\mu g/m^3$	1E-02	$\mu g/m^3$	3.4E-05	$(\mu g/m^3)^{-1}$	4E-07	1E-01	$\mu g/m^3$	3.0E+00	$\mu g/m^3$	4E-02
			Exposure Route Total								5E-04					1E+01
		Exposure Point Total									3E-03					7E+02
	Total of Receptor Risks Across Medium										3E-03					7E+02

Notes

^ To calculate cancer risks for these carcinogenic COPCs with a mutagenic mode of action, age-dependent adjustment factors (ADAF) were applied to the cancer slope factors. For the resident child, an ADAF of 10 was used to evaluate exposure between the ages of 0-2; an ADAF of 3 was used to evaluate exposure between the ages of 2-6. To facilitate application of the ADAFs, intakes and dermally absorbed doses were calculated for each of the corresponding age groups, and the appropriate ADAF was applied to the cancer slope factor.

N/A - Not Applicable

NA - Not Available

TABLE 7.6.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Tap Water	Ingestion	Benzene	7.2E-04	mg/L	2E-06	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	1E-07	2E-05	mg/kg-day	4.0E-03	mg/kg-day	6E-03
				Bromodichloromethane	4.1E-04	mg/L	1E-06	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	7E-08	1E-05	mg/kg-day	2.0E-02	mg/kg-day	6E-04
				Chlorobenzene	3.7E-03	mg/L	1E-05	mg/kg-day	NA	--	--	1E-04	mg/kg-day	2.0E-02	mg/kg-day	6E-03
				Chloroform	2.8E-03	mg/L	8E-06	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	2E-07	9E-05	mg/kg-day	1.0E-02	mg/kg-day	9E-03
				Dibromochloromethane	3.4E-04	mg/L	9E-07	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	8E-08	1E-05	mg/kg-day	2.0E-02	mg/kg-day	5E-04
				1,2-Dichlorobenzene	2.1E-03	mg/L	6E-06	mg/kg-day	NA	--	--	7E-05	mg/kg-day	9.0E-02	mg/kg-day	8E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	1E-05	mg/kg-day	NA	--	--	2E-04	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	1E-05	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	7E-08	2E-04	mg/kg-day	7.0E-02	mg/kg-day	2E-03
				1,1-Dichloroethane	7.0E-04	mg/L	2E-06	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	1E-08	2E-05	mg/kg-day	2.0E-01	mg/kg-day	1E-04
				1,2-Dichloroethane	5.6E-04	mg/L	2E-06	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	1E-07	2E-05	mg/kg-day	NA	--	--
				1,1-Dichloroethene	5.7E-03	mg/L	2E-05	mg/kg-day	NA	--	--	2E-04	mg/kg-day	5.0E-02	mg/kg-day	4E-03
				cis-1,2-Dichloroethene	1.4E+01	mg/L	4E-02	mg/kg-day	NA	--	--	5E-01	mg/kg-day	2.0E-03	mg/kg-day	2E+02
				trans-1,2-Dichloroethene	6.1E-02	mg/L	2E-04	mg/kg-day	NA	--	--	2E-03	mg/kg-day	2.0E-02	mg/kg-day	1E-01
				Methyl tert-butyl ether	1.3E-02	mg/L	3E-05	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	6E-08	4E-04	mg/kg-day	NA	--	--
				Methylene chloride	5.0E-04	mg/L	1E-06	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	1E-08	2E-05	mg/kg-day	6.0E-02	mg/kg-day	3E-04
				Tetrachloroethene	3.6E-02	mg/L	1E-04	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	5E-05	1E-03	mg/kg-day	1.0E-02	mg/kg-day	1E-01
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	2E-05	mg/kg-day	NA	--	--	3E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	2E-04	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	5E-06	2E-03	mg/kg-day	1.0E-02	mg/kg-day	2E-01
				1,1,2-Trichloroethane	3.9E-03	mg/L	1E-05	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	6E-07	1E-04	mg/kg-day	4.0E-03	mg/kg-day	3E-02
				Trichloroethene	7.0E+00	mg/L	2E-02	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	1E-04	2E-01	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	1E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	2E-04	2E-03	mg/kg-day	3.0E-03	mg/kg-day	6E-01
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	2E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	2E-07	2E-04	mg/kg-day	2.0E-02	mg/kg-day	9E-03
				Dibenzo(a,h)anthracene ^	1.7E-04	mg/L	1E-07	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	1E-05	5E-06	mg/kg-day	NA	--	--
							7E-08	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	1E-06					
				Indeno(1,2,3-cd)pyrene ^	1.4E-04	mg/L	1E-07	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	8E-07	5E-06	mg/kg-day	NA	--	--
							6E-08	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	1E-07					
				Naphthalene	3.4E-04	mg/L	9E-07	mg/kg-day	NA	--	--	1E-05	mg/kg-day	2.0E-02	mg/kg-day	5E-04
				Total PCB Aroclors	4.4E-03	mg/L	1E-05	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	5E-06	1E-04	mg/kg-day	2.0E-05	mg/kg-day	7E+00
				gamma-Chlordane	7.5E-04	mg/L	2E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	7E-07	2E-05	mg/kg-day	5.0E-04	mg/kg-day	5E-02
				4,4'-DDD	2.3E-04	mg/L	6E-07	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	1E-07	7E-06	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	8E-07	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	3E-07	9E-06	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	1E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	5E-07	2E-05	mg/kg-day	5.0E-04	mg/kg-day	3E-02
				Heptachlor	3.6E-03	mg/L	1E-05	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	4E-05	1E-04	mg/kg-day	5.0E-04	mg/kg-day	2E-01
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	7E-11	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	1E-05	8E-10	mg/kg-day	1.0E-09	mg/kg-day	8E-01
				Aluminum	2.7E-01	mg/L	7E-04	mg/kg-day	NA	--	--	9E-03	mg/kg-day	1.0E+00	mg/kg-day	9E-03
				Arsenic	7.6E-02	mg/L	2E-04	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	3E-04	2E-03	mg/kg-day	3.0E-04	mg/kg-day	8E+00
				Barium	5.4E-01	mg/L	1E-03	mg/kg-day	NA	--	--	2E-02	mg/kg-day	2.0E-01	mg/kg-day	9E-02
				Cadmium	5.6E-04	mg/L	2E-06	mg/kg-day	NA	--	--	2E-05	mg/kg-day	5.0E-04	mg/kg-day	4E-02
				Chromium ^	2.3E-03	mg/L	2E-06	mg/kg-day	5.0E+00	(mg/kg-day)$^{-1}$	9E-06	7E-05	mg/kg-day	3.0E-03	mg/kg-day	2E-02
							9E-07	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	1E-06					
				Cobalt	4.2E-04	mg/L	1E-06	mg/kg-day	NA	--	--	1E-05	mg/kg-day	3.0E-04	mg/kg-day	4E-02
				Iron	5.4E-01	mg/L	1E-03	mg/kg-day	NA	--	--	2E-02	mg/kg-day	7.0E-01	mg/kg-day	2E-02
				Manganese	3.2E-01	mg/L	9E-04	mg/kg-day	NA	--	--	1E-02	mg/kg-day	2.4E-02	mg/kg-day	4E-01
				Vanadium	7.4E-03	mg/L	2E-05	mg/kg-day	NA	--	--	2E-04	mg/kg-day	5.0E-03	mg/kg-day	5E-02
			Exposure Route Total								8E-04					2E+02

TABLE 7.6.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Shower	Dermal Absorption	Benzene	7.2E-04	mg/L	1E-07	mg/kg-day	5.5E-02	(mg/kg-day)$^{-1}$	6E-09	1E-06	mg/kg-day	4.0E-03	mg/kg-day	5E-09
				Bromodichloromethane	4.1E-04	mg/L	N/A	mg/kg-day	6.2E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Chlorobenzene	3.7E-03	mg/L	1E-06	mg/kg-day	NA	--	--	2E-05	mg/kg-day	2.0E-02	mg/kg-day	8E-04
				Chloroform	2.8E-03	mg/L	N/A	mg/kg-day	3.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	1.0E-02	mg/kg-day	N/A
				Dibromochloromethane	3.4E-04	mg/L	N/A	mg/kg-day	8.4E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				1,2-Dichlorobenzene	2.1E-03	mg/L	1E-06	mg/kg-day	NA	--	--	2E-05	mg/kg-day	9.0E-02	mg/kg-day	2E-04
				1,3-Dichlorobenzene	5.2E-03	mg/L	5E-06	mg/kg-day	NA	--	--	6E-05	mg/kg-day	NA	--	--
				1,4-Dichlorobenzene	5.0E-03	mg/L	3E-06	mg/kg-day	5.4E-03	(mg/kg-day)$^{-1}$	2E-08	4E-05	mg/kg-day	7.0E-02	mg/kg-day	6E-04
				1,1-Dichloroethane	7.0E-04	mg/L	N/A	mg/kg-day	5.7E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	2.0E-01	mg/kg-day	N/A
				1,2-Dichloroethane	5.6E-04	mg/L	N/A	mg/kg-day	9.1E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				1,1-Dichloroethene	5.7E-03	mg/L	8E-07	mg/kg-day	NA	--	--	9E-06	mg/kg-day	5.0E-02	mg/kg-day	2E-04
				cis-1,2-Dichloroethene	1.4E+01	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-03	mg/kg-day	N/A
				trans-1,2-Dichloroethene	6.1E-02	mg/L	N/A	mg/kg-day	NA	--	N/A	N/A	mg/kg-day	2.0E-02	mg/kg-day	N/A
				Methyl tert-butyl ether	1.3E-02	mg/L	N/A	mg/kg-day	1.8E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	NA	--	N/A
				Methylene chloride	5.0E-04	mg/L	N/A	mg/kg-day	7.5E-03	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	6.0E-02	mg/kg-day	N/A
				Tetrachloroethene	3.6E-02	mg/L	2E-05	mg/kg-day	5.4E-01	(mg/kg-day)$^{-1}$	1E-05	3E-04	mg/kg-day	1.0E-02	mg/kg-day	3E-02
				1,2,3-Trichlorobenzene	8.5E-03	mg/L	1E-05	mg/kg-day	NA	--	--	1E-04	mg/kg-day	NA	--	--
				1,2,4-Trichlorobenzene	5.8E-02	mg/L	8E-05	mg/kg-day	2.9E-02	(mg/kg-day)$^{-1}$	2E-06	9E-04	mg/kg-day	1.0E-02	mg/kg-day	9E-02
				1,1,2-Trichloroethane	3.9E-03	mg/L	N/A	mg/kg-day	5.7E-02	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	4.0E-03	mg/kg-day	N/A
				Trichloroethene	7.0E+00	mg/L	1E-03	mg/kg-day	5.9E-03	(mg/kg-day)$^{-1}$	7E-06	1E-02	mg/kg-day	NA	--	--
				Vinyl chloride	5.3E-02	mg/L	N/A	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	N/A	N/A	mg/kg-day	3.0E-03	mg/kg-day	N/A
				bis(2-Ethylhexyl)phthalate	5.7E-03	mg/L	2E-05	mg/kg-day	1.4E-02	(mg/kg-day)$^{-1}$	3E-07	2E-04	mg/kg-day	2.0E-02	mg/kg-day	1E-02
				Dibenzo(a,h)anthracene ^	1.7E-04	mg/L	2E-06	mg/kg-day	7.3E+01	(mg/kg-day)$^{-1}$	2E-04	1E-04	mg/kg-day	NA	--	--
							2E-06	mg/kg-day	2.2E+01	(mg/kg-day)$^{-1}$	4E-05					
				Indeno(1,2,3-cd)pyrene ^	1.4E-04	mg/L	1E-06	mg/kg-day	7.3E+00	(mg/kg-day)$^{-1}$	9E-06	8E-05	mg/kg-day	NA	--	--
							1E-06	mg/kg-day	2.2E+00	(mg/kg-day)$^{-1}$	2E-06					
				Naphthalene	3.4E-04	mg/L	2E-07	mg/kg-day	NA	--	--	3E-06	mg/kg-day	2.0E-02	mg/kg-day	1E-04
				Total PCB Aroclors	4.4E-03	mg/L	2E-04	mg/kg-day	4.0E-01	(mg/kg-day)$^{-1}$	7E-05	2E-03	mg/kg-day	2.0E-05	mg/kg-day	1E+02
				gamma-Chlordane	7.5E-04	mg/L	4E-06	mg/kg-day	3.5E-01	(mg/kg-day)$^{-1}$	1E-06	4E-05	mg/kg-day	5.0E-04	mg/kg-day	8E-02
				4,4'-DDD	2.3E-04	mg/L	3E-06	mg/kg-day	2.4E-01	(mg/kg-day)$^{-1}$	8E-07	4E-05	mg/kg-day	NA	--	--
				4,4'-DDE	2.7E-04	mg/L	3E-06	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	1E-06	4E-05	mg/kg-day	NA	--	--
				4,4'-DDT	4.9E-04	mg/L	1E-05	mg/kg-day	3.4E-01	(mg/kg-day)$^{-1}$	4E-06	1E-04	mg/kg-day	5.0E-04	mg/kg-day	3E-01
				Heptachlor	3.6E-03	mg/L	3E-06	mg/kg-day	4.5E+00	(mg/kg-day)$^{-1}$	2E-05	4E-05	mg/kg-day	5.0E-04	mg/kg-day	8E-02
				2,3,7,8-TCDD Toxic Equivalence	2.6E-08	mg/L	1E-09	mg/kg-day	1.6E+05	(mg/kg-day)$^{-1}$	2E-04	1E-08	mg/kg-day	1.0E-09	mg/kg-day	1E+01
				Aluminum	2.7E-01	mg/L	1E-06	mg/kg-day	NA	--	--	2E-05	mg/kg-day	1.0E+00	mg/kg-day	2E-05
				Arsenic	7.6E-02	mg/L	4E-07	mg/kg-day	1.5E+00	(mg/kg-day)$^{-1}$	6E-07	5E-06	mg/kg-day	3.0E-04	mg/kg-day	2E-02
				Barium	5.4E-01	mg/L	3E-06	mg/kg-day	NA	--	--	3E-05	mg/kg-day	1.4E-02	mg/kg-day	2E-03
				Cadmium	5.6E-04	mg/L	3E-09	mg/kg-day	NA	--	--	4E-08	mg/kg-day	2.5E-05	mg/kg-day	1E-03
				Chromium ^	2.3E-03	mg/L	5E-09	mg/kg-day	2.0E+02	(mg/kg-day)$^{-1}$	9E-07	3E-07	mg/kg-day	7.5E-05	mg/kg-day	4E-03
							4E-09		6.0E+01		2E-07					
				Cobalt	4.2E-04	mg/L	9E-10	mg/kg-day	NA	--	--	1E-08	mg/kg-day	3.0E-04	mg/kg-day	4E-05
				Iron	5.4E-01	mg/L	3E-06	mg/kg-day	NA	--	--	3E-05	mg/kg-day	7.0E-01	mg/kg-day	5E-05
				Manganese	3.2E-01	mg/L	2E-06	mg/kg-day	NA	--	--	2E-05	mg/kg-day	9.6E-04	mg/kg-day	2E-02
				Vanadium	7.4E-03	mg/L	4E-08	mg/kg-day	NA	--	--	5E-07	mg/kg-day	1.3E-04	mg/kg-day	4E-03
			Exposure Route Total								5E-04					1E+02

TABLE 7.6.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake / Exposure Concentration		Cancer Slope Factor / Unit Risk		Cancer Risk	Intake / Exposure Concentration		Reference Dose / Reference Concentration		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Entire Aquifer	Bathroom Air	Inhalation	Benzene	2.4E+00	µg/m^3	3E-03	µg/m^3	7.8E-06	(µg/m^3)$^{-1}$	2E-08	3E-02	µg/m^3	3.0E+01	µg/m^3	1E-03
				Bromodichloromethane	1.3E+00	µg/m^3	1E-03	µg/m^3	3.7E-05	(µg/m^3)$^{-1}$	6E-08	2E-02	µg/m^3	NA	--	--
				Chlorobenzene	1.2E+01	µg/m^3	1E-02	µg/m^3	NA	--	--	2E-01	µg/m^3	5.0E+01	µg/m^3	3E-03
				Chloroform	9.1E+00	µg/m^3	1E-02	µg/m^3	2.3E-05	(µg/m^3)$^{-1}$	2E-07	1E-01	µg/m^3	9.8E+01	µg/m^3	1E-03
				Dibromochloromethane	1.1E+00	µg/m^3	1E-03	µg/m^3	2.7E-05	(µg/m^3)$^{-1}$	3E-08	1E-02	µg/m^3	NA	--	--
				1,2-Dichlorobenzene	7.0E+00	µg/m^3	8E-03	µg/m^3	NA	--	--	9E-02	µg/m^3	2.0E+02	µg/m^3	5E-04
				1,3-Dichlorobenzene	1.7E+01	µg/m^3	2E-02	µg/m^3	NA	--	--	2E-01	µg/m^3	NA	--	--
				1,4-Dichlorobenzene	1.6E+01	µg/m^3	2E-02	µg/m^3	1.1E-05	(µg/m^3)$^{-1}$	2E-07	2E-01	µg/m^3	8.0E+02	µg/m^3	3E-04
				1,1-Dichloroethane	2.3E+00	µg/m^3	3E-03	µg/m^3	1.6E-06	(µg/m^3)$^{-1}$	4E-09	3E-02	µg/m^3	NA	--	--
				1,2-Dichloroethane	1.8E+00	µg/m^3	2E-03	µg/m^3	2.6E-05	(µg/m^3)$^{-1}$	5E-08	2E-02	µg/m^3	7.0E+00	µg/m^3	3E-03
				1,1-Dichloroethene	1.9E+01	µg/m^3	2E-02	µg/m^3	NA	--	--	2E-01	µg/m^3	2.0E+02	µg/m^3	1E-03
				cis-1,2-Dichloroethene	4.6E+04	µg/m^3	5E+01	µg/m^3	NA	--	--	6E+02	µg/m^3	NA	--	--
				trans-1,2-Dichloroethene	2.0E+02	µg/m^3	2E-01	µg/m^3	NA	--	--	3E+00	µg/m^3	6.0E+01	µg/m^3	4E-02
				Methyl tert-butyl ether	4.1E+01	µg/m^3	5E-02	µg/m^3	2.6E-07	(µg/m^3)$^{-1}$	1E-08	5E-01	µg/m^3	3.0E+03	µg/m^3	2E-04
				Methylene chloride	1.6E+00	µg/m^3	2E-03	µg/m^3	4.7E-07	(µg/m^3)$^{-1}$	9E-10	2E-02	µg/m^3	1.0E+03	µg/m^3	2E-05
				Tetrachloroethene	1.2E+02	µg/m^3	1E-01	µg/m^3	5.9E-06	(µg/m^3)$^{-1}$	8E-07	2E+00	µg/m^3	2.7E+02	µg/m^3	6E-03
				1,2,3-Trichlorobenzene	2.8E+01	µg/m^3	3E-02	µg/m^3	NA	--	--	4E-01	µg/m^3	NA	--	--
				1,2,4-Trichlorobenzene	1.9E+02	µg/m^3	2E-01	µg/m^3	NA	--	--	3E+00	µg/m^3	2.0E+00	µg/m^3	1E+00
				1,1,2-Trichloroethane	1.3E+01	µg/m^3	1E-02	µg/m^3	1.6E-05	(µg/m^3)$^{-1}$	2E-07	2E-01	µg/m^3	NA	--	--
				Trichloroethene	2.3E+04	µg/m^3	3E+01	µg/m^3	2.0E-06	(µg/m^3)$^{-1}$	5E-05	3E+02	µg/m^3	NA	--	--
				Vinyl chloride	1.7E+02	µg/m^3	2E-01	µg/m^3	8.8E-06	(µg/m^3)$^{-1}$	2E-06	2E+00	µg/m^3	1.0E+02	µg/m^3	2E-02
				Naphthalene	1.1E+00	µg/m^3	1E-03	µg/m^3	3.4E-05	(µg/m^3)$^{-1}$	4E-08	1E-02	µg/m^3	3.0E+00	µg/m^3	5E-03
			Exposure Route Total								6E-05					1E+00
		Exposure Point Total									1E-03					4E+02
	Total of Receptor Risks Across Medium										1E-03					4E+02

Notes
^ To calculate cancer risks for these carcinogenic COPCs with a mutagenic mode of action, age-dependent adjustment factors (ADAF) were applied to the cancer slope factors. For the resident child, an ADAF of 10 was used to evaluate exposure between the ages of 0-2; an ADAF of 3 was used to evaluate exposure between the ages of 2-6. To facilitate application of the ADAFs, intakes and dermally absorbed doses were calculated for each of the corresponding age groups, and the appropriate ADAF was applied to the cancer slope factor.
N/A - Not Applicable
NA - Not Available

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Process Water	Benzene	N/A	1E-06	5E-08		1E-06	Blood	N/A	1E-02	6E-04	1E-02
			Bromodichloromethane	N/A	3E-06	1E-08		3E-06	Kidney	N/A	--	3E-05	3E-05
			Chlorobenzene	N/A	--	--		--	Kidney; Liver	N/A	4E-02	1E-03	4E-02
			Chloroform	N/A	1E-05	5E-08		1E-05	Liver	N/A	1E-02	5E-04	1E-02
			Dibromochloromethane	N/A	2E-06	1E-08		2E-06	Liver	N/A	--	2E-05	2E-05
			1,2-Dichlorobenzene	N/A	--	--		--	Developmental	N/A	5E-03	2E-04	6E-03
			1,3-Dichlorobenzene	N/A	--	--		--	--	N/A	--	--	--
			1,4-Dichlorobenzene	N/A	1E-05	1E-07		1E-05	Liver	N/A	3E-03	7E-04	4E-03
			1,1-Dichloroethane	N/A	2E-07	2E-09		2E-07	Kidney; Neurological	N/A	--	6E-06	6E-06
			1,2-Dichloroethane	N/A	3E-06	2E-08		3E-06	Neurological	N/A	4E-02	--	4E-02
			1,1-Dichloroethene	N/A	--	--		--	Liver	N/A	1E-02	3E-04	1E-02
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	1E+01	1E+01
			trans-1,2-Dichloroethene	N/A	--	--		--	Blood; Liver; Respiratory	N/A	5E-01	6E-03	5E-01
			Methyl tert-butyl ether	N/A	6E-07	4E-09		6E-07	Kidney; Liver	N/A	2E-03	--	2E-03
			Methylene chloride	N/A	4E-08	1E-09		4E-08	Liver	N/A	2E-04	7E-06	3E-04
			Tetrachloroethene	N/A	4E-05	6E-05		1E-04	Liver; Neurological	N/A	7E-02	3E-02	1E-01
			1,2,3-Trichlorobenzene	N/A	--	--		--	--	N/A	--	--	--
			1,2,4-Trichlorobenzene	N/A	--	1E-05		1E-05	Kidney; Blood	N/A	1E+01	1E-01	1E+01
			1,1,2-Trichloroethane	N/A	1E-05	1E-07		1E-05	Blood	N/A	--	2E-03	2E-03
			Trichloroethene	N/A	2E-03	4E-05		3E-03	--	N/A	--	--	--
			Vinyl chloride	N/A	4E-05	2E-05		6E-05	Liver	N/A	3E-01	2E-02	3E-01
			bis(2-Ethylhexyl)phthalate	N/A	N/A	6E-07		6E-07	Liver	N/A	N/A	6E-03	6E-03
			Dibenzo(a,h)anthracene	N/A	N/A	2E-04		2E-04	--	N/A	N/A	--	--
			Indeno(1,2,3-cd)pyrene	N/A	N/A	1E-05		1E-05	--	N/A	N/A	--	--
			Naphthalene	N/A	2E-06	--		2E-06	Developmental	N/A	6E-02	2E-04	6E-02
			Total PCB Aroclors	N/A	N/A	2E-04		2E-04	Eye; Developmental; Immunological	N/A	N/A	6E+01	6E+01
			gamma-Chlordane	N/A	N/A	3E-06		3E-06	Liver	N/A	N/A	5E-02	5E-02
			4,4'-DDD	N/A	N/A	2E-06		2E-06	--	N/A	N/A	--	--
			4,4'-DDE	N/A	N/A	3E-06		3E-06	--	N/A	N/A	--	--
			4,4'-DDT	N/A	N/A	9E-06		9E-06	Liver	N/A	N/A	2E-01	2E-01
			Heptachlor	N/A	N/A	4E-05		4E-05	Liver	N/A	N/A	5E-02	5E-02
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	4E-04		4E-04	Developmental	N/A	N/A	7E+00	7E+00
			Aluminum	N/A	N/A	--		--	Neurological	N/A	N/A	7E-05	7E-05
			Arsenic	N/A	N/A	1E-05		1E-05	Skin; Developmental; Cardiovascular; Neurological	N/A	N/A	7E-02	7E-02
			Barium	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	1E-02	1E-02
			Cadmium	N/A	N/A	--		--	Kidney	N/A	N/A	6E-03	6E-03
			Chromium	N/A	N/A	8E-06		8E-06	Respiratory	N/A	N/A	2E-02	2E-02
			Cobalt	N/A	N/A	--		--	Endocrine; Respiratory	N/A	N/A	1E-04	1E-04
			Iron	N/A	N/A	--		--	GI tract	N/A	N/A	2E-04	2E-04
			Manganese	N/A	N/A	--		--	Neurological	N/A	N/A	9E-02	9E-02
			Vanadium	N/A	N/A	--		--	--	N/A	N/A	1E-02	1E-02
			Chemical Total	--	3E-03	1E-03		4E-03		--	2E+01	8E+01	9E+01
		Exposure Point Total						4E-03					9E+01
	Exposure Medium Total							4E-03					9E+01
Medium Total								4E-03					9E+01
Receptor Total							Receptor Risk Total	4E-03				Receptor HI Total	9E+01

Notes
N/A - Not Applicable

Blood HI Across All Media =	2E+01
Kidney HI Across All Media =	3E+01
Liver HI Across All Media =	1E+00
Developmental HI Across All Media =	6E+01
Neurological HI Across All Media =	3E-01
Respiratory HI Across All Media =	5E-01
Eye HI Across All Media =	6E+01
Immunological HI Across All Media =	6E+01
Skin HI Across All Media =	7E-02
Cardiovascular HI Across All Media =	7E-02
Endocrine HI Across All Media =	1E-04
GI tract HI Across All Media =	2E-04

TABLE 9.1.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Process Water	Benzene	N/A	1E-07	6E-09		2E-07	Blood	N/A	7E-03	3E-04	7E-03
			Bromodichloromethane	N/A	4E-07	1E-09		4E-07	Kidney	N/A	--	1E-05	1E-05
			Chlorobenzene	N/A	--	--		--	Kidney; Liver	N/A	2E-02	5E-04	2E-02
			Chloroform	N/A	2E-06	6E-09		2E-06	Liver	N/A	8E-03	2E-04	8E-03
			Dibromochloromethane	N/A	2E-07	1E-09		2E-07	Liver	N/A	--	8E-06	8E-06
			1,2-Dichlorobenzene	N/A	--	--		--	Developmental	N/A	3E-03	1E-04	3E-03
			1,3-Dichlorobenzene	N/A	--	--		--	--	N/A	--	--	--
			1,4-Dichlorobenzene	N/A	1E-06	1E-08		1E-06	Liver	N/A	2E-03	3E-04	2E-03
			1,1-Dichloroethane	N/A	3E-08	3E-10		3E-08	Kidney; Neurological	N/A	--	3E-06	3E-06
			1,2-Dichloroethane	N/A	4E-07	2E-09		4E-07	Neurological	N/A	2E-02	--	2E-02
			1,1-Dichloroethene	N/A	--	--		--	Liver	N/A	8E-03	1E-04	8E-03
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	6E+00	6E+00
			trans-1,2-Dichloroethene	N/A	--	--		--	Blood; Liver; Respiratory	N/A	3E-01	3E-03	3E-01
			Methyl tert-butyl ether	N/A	9E-08	5E-10		9E-08	Kidney; Liver	N/A	1E-03	--	1E-03
			Methylene chloride	N/A	6E-09	1E-10		6E-09	Liver	N/A	1E-04	3E-06	1E-04
			Tetrachloroethene	N/A	6E-06	7E-06		1E-05	Liver; Neurological	N/A	4E-02	1E-02	5E-02
			1,2,3-Trichlorobenzene	N/A	--	--		--	--	N/A	--	--	--
			1,2,4-Trichlorobenzene	N/A	--	1E-06		1E-06	Kidney; Blood	N/A	8E+00	5E-02	8E+00
			1,1,2-Trichloroethane	N/A	2E-06	2E-08		2E-06	Blood	N/A	--	7E-04	7E-04
			Trichloroethene	N/A	4E-04	5E-06		4E-04	--	N/A	--	--	--
			Vinyl chloride	N/A	6E-06	2E-06		8E-06	Liver	N/A	1E-01	1E-02	2E-01
			bis(2-Ethylhexyl)phthalate	N/A	N/A	1E-07		1E-07	Liver	N/A	N/A	5E-03	5E-03
			Dibenzo(a,h)anthracene	N/A	N/A	4E-05		4E-05	--	N/A	N/A	--	--
			Indeno(1,2,3-cd)pyrene	N/A	N/A	3E-06		3E-06	--	N/A	N/A	--	--
			Naphthalene	N/A	3E-07	--		3E-07	Developmental	N/A	3E-02	8E-05	3E-02
			Total PCB Aroclors	N/A	N/A	4E-05		4E-05	Eye; Developmental; Immunological	N/A	N/A	5E+01	5E+01
			gamma-Chlordane	N/A	N/A	7E-07		7E-07	Liver	N/A	N/A	4E-02	4E-02
			4,4'-DDD	N/A	N/A	4E-07		4E-07	--	N/A	N/A	--	--
			4,4'-DDE	N/A	N/A	6E-07		6E-07	--	N/A	N/A	--	--
			4,4'-DDT	N/A	N/A	2E-06		2E-06	Liver	N/A	N/A	1E-01	1E-01
			Heptachlor	N/A	N/A	8E-06		8E-06	Liver	N/A	N/A	4E-02	4E-02
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	9E-05		9E-05	Developmental	N/A	N/A	6E+00	6E+00
			Aluminum	N/A	N/A	--		--	Neurological	N/A	N/A	5E-05	5E-05
			Arsenic	N/A	N/A	2E-06		2E-06	Skin; Developmental; Cardiovascular; Neurological	N/A	N/A	5E-02	5E-02
			Barium	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	8E-03	8E-03
			Cadmium	N/A	N/A	--		--	Kidney	N/A	N/A	4E-03	4E-03
			Chromium	N/A	N/A	2E-06		2E-06	Respiratory	N/A	N/A	1E-02	1E-02
			Cobalt	N/A	N/A	--		--	Endocrine; Respiratory	N/A	N/A	1E-04	1E-04
			Iron	N/A	N/A	--		--	GI tract	N/A	N/A	1E-04	1E-04
			Manganese	N/A	N/A	--		--	Neurological	N/A	N/A	6E-02	6E-02
			Vanadium	N/A	N/A	--		--	--	N/A	N/A	1E-02	1E-02
			Chemical Total	--	4E-04	2E-04		6E-04		--	9E+00	6E+01	7E+01
		Exposure Point Total						6E-04					7E+01
	Exposure Medium Total							6E-04					7E+01
Medium Total								6E-04					7E+01
Receptor Total							Receptor Risk Total	6E-04				Receptor HI Total	7E+01

Notes
N/A - Not Applicable

Blood HI Across All Media =	8E+00
Kidney HI Across All Media =	1E+01
Liver HI Across All Media =	7E-01
Developmental HI Across All Media =	6E+01
Neurological HI Across All Media =	2E-01
Respiratory HI Across All Media =	3E-01
Eye HI Across All Media =	5E+01
Immunological HI Across All Media =	5E+01
Skin HI Across All Media =	5E-02
Cardiovascular HI Across All Media =	5E-02
Endocrine HI Across All Media =	1E-04
GI tract HI Across All Media =	1E-04

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Onsite Groundwater	Top of the Groundwater Table	Benzene	N/A	3E-11	2E-09		2E-09	Blood	N/A	1E-05	1E-03	1E-03
			Chlorobenzene	N/A	--	--		--	Kidney; Liver; GI tract; Blood	N/A	9E-06	2E-03	2E-03
			Chloroform	N/A	6E-11	6E-10		7E-10	Liver	N/A	4E-06	6E-05	6E-05
			1,2-Dibromo-3-chloropropane	N/A	2E-10	6E-10		8E-10	Reproductive	N/A	6E-06	1E-04	1E-04
			Dibromochloromethane	N/A	1E-11	2E-10		2E-10	Liver	N/A	--	1E-05	1E-05
			1,2-Dichlorobenzene	N/A	--	--		--	Liver	N/A	1E-06	1E-04	1E-04
			1,3-Dichlorobenzene	N/A	--	--		--	Endocrine	N/A	--	1E-02	1E-02
			1,4-Dichlorobenzene	N/A	2E-10	4E-09		4E-09	Liver	N/A	2E-06	3E-03	3E-03
			1,1-Dichloroethane	N/A	5E-12	1E-10		1E-10	Kidney; Neurological	N/A	--	3E-06	3E-06
			1,2-Dichloroethane	N/A	1E-10	2E-09		2E-09	Kidney; Neurological	N/A	2E-05	3E-04	3E-04
			1,1-Dichloroethene	N/A	--	--		--	Liver	N/A	1E-04	5E-03	5E-03
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	2E+01	2E+01
			trans-1,2-Dichloroethene	N/A	--	--		--	Blood; Liver	N/A	3E-04	7E-03	7E-03
			Ethylbenzene	N/A	3E-11	5E-09		5E-09	Liver	N/A	4E-07	1E-03	1E-03
			Methylcyclohexane	N/A	--	--		--	Kidney	N/A	7E-07	--	7E-07
			Methylene chloride	N/A	4E-12	2E-10		2E-10	Liver	N/A	3E-06	1E-04	1E-04
			Tetrachloroethene	N/A	3E-09	1E-05		1E-05	Liver	N/A	5E-04	6E-02	6E-02
			1,2,3-Trichlorobenzene	N/A	--	--		--	Developmental; Liver; Endocrine	N/A	--	2E-01	2E-01
			1,2,4-Trichlorobenzene	N/A	--	3E-07		3E-07	Kidney; Blood	N/A	2E-03	4E-02	4E-02
			1,1,2-Trichloroethane	N/A	2E-10	5E-09		5E-09	Liver	N/A	--	7E-03	7E-03
			Trichloroethene	N/A	4E-08	2E-06		2E-06	--	N/A	--	--	--
			o-Xylene	N/A	--	--		--	Developmental	N/A	3E-05	1E-03	1E-03
			Vinyl chloride	N/A	1E-09	6E-07		6E-07	Liver	N/A	7E-04	9E-02	9E-02
			Benzo(a)anthracene	N/A	N/A	3E-07		3E-07	--	N/A	N/A	--	--
			Benzo(a)pyrene	N/A	N/A	3E-06		3E-06	--	N/A	N/A	--	--
			Benzo(b)fluoranthene	N/A	N/A	2E-06		2E-06	--	N/A	N/A	--	--
			Benzo(g,h,i)perylene	N/A	N/A	--		--	--	N/A	N/A	--	--
			Benzo(k)fluoranthene	N/A	N/A	5E-08		5E-08	--	N/A	N/A	--	--
			1,1-Biphenyl	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	7E-04	7E-04
			Dibenzo(a,h)anthracene	N/A	N/A	2E-05		2E-05	--	N/A	N/A	--	--
			Indeno(1,2,3-cd)pyrene	N/A	N/A	3E-07		3E-07	--	N/A	N/A	--	--
			Naphthalene	N/A	6E-11	--		6E-11	Developmental	N/A	2E-04	1E-04	3E-04
			Phenanthrene	N/A	--	--		--	--	N/A	--	--	--
			Total PCB Aroclors	N/A	N/A	4E-06		4E-06	Eye; Developmental; Immunological	N/A	N/A	5E+01	5E+01
			alpha-BHC	N/A	N/A	6E-08		6E-08	--	N/A	N/A	4E-04	4E-04
			delta-BHC	N/A	N/A	--		--	--	N/A	N/A	--	--
			gamma-BHC	N/A	N/A	4E-09		4E-09	Kidney; Liver	N/A	N/A	4E-04	4E-04
			gamma-Chlordane	N/A	N/A	8E-08		8E-08	Liver	N/A	N/A	1E-01	1E-01
			4,4'-DDD	N/A	N/A	5E-08		5E-08	--	N/A	N/A	--	--
			4,4'-DDE	N/A	N/A	1E-07		1E-07	--	N/A	N/A	--	--
			4,4'-DDT	N/A	N/A	4E-07		4E-07	Liver	N/A	N/A	7E-01	7E-01
			Dieldrin	N/A	N/A	2E-07		2E-07	Neurological	N/A	N/A	5E-02	5E-02
			Endosulfan II	N/A	N/A	--		--	--	N/A	N/A	7E-04	7E-04
			Endosulfan sulfate	N/A	N/A	--		--	--	N/A	N/A	--	--
			Endrin aldehyde	N/A	N/A	--		--	--	N/A	N/A	--	--
			Heptachlor	N/A	N/A	9E-08		9E-08	--	N/A	N/A	1E-02	1E-02
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	8E-06		8E-06	Immunological	N/A	N/A	8E-01	8E-01
			Aluminum	N/A	N/A	--		--	Neurological	N/A	N/A	5E-04	5E-04
			Arsenic	N/A	N/A	2E-07		2E-07	Skin, Developmental; Cardiovascular; Neurological	N/A	N/A	1E-01	1E-01
			Barium	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	2E-02	2E-02
			Cadmium	N/A	N/A	--		--	Musculoskeletal	N/A	N/A	4E-02	4E-02
			Chromium	N/A	N/A	1E-06		1E-06	Respiratory	N/A	N/A	3E-02	3E-02
			Cobalt	N/A	N/A	--		--	Endocrine; Respiratory	N/A	N/A	3E-05	3E-05
			Iron	N/A	N/A	--		--	GI tract	N/A	N/A	1E-03	1E-03
			Manganese	N/A	N/A	--		--	--	N/A	N/A	2E-01	2E-01
			Vanadium	N/A	N/A	--		--	--	N/A	N/A	2E-02	2E-02
			Chemical Total	--	5E-08	5E-05		5E-05		--	4E-03	7E+01	7E+01
		Exposure Point Total						5E-05					7E+01
	Exposure Medium Total							5E-05					7E+01
Medium Total								5E-05					7E+01
Receptor Total							Receptor Risk Total	5E-05				Receptor HI Total	7E+01

Notes
N/A - Not Applicable

Blood HI Across All Media =	5E-02
Kidney HI Across All Media =	2E+01
Liver HI Across All Media =	1E+00
Developmental HI Across All Media =	5E+01
Neurological HI Across All Media =	2E-01
Respiratory HI Across All Media =	3E-05
Eye HI Across All Media =	5E+01
Immunological HI Across All Media =	5E+01
Skin HI Across All Media =	1E-01
Cardiovascular HI Across All Media =	1E-01
Endocrine HI Across All Media =	2E-01
GI tract HI Across All Media =	3E-03
Reproductive HI Across All Media =	1E-04
Musculoskeletal HI Across All Media =	4E-02

TABLE 9.2.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Onsite Groundwater	Top of the Groundwater Table	Benzene	N/A	7E-12	6E-10		6E-10	Blood	N/A	1E-05	9E-04	9E-04
			Chlorobenzene	N/A	--	--		--	Kidney; Liver; GI tract; Blood	N/A	7E-06	2E-03	2E-03
			Chloroform	N/A	2E-11	2E-10		2E-10	Liver	N/A	3E-06	5E-05	5E-05
			1,2-Dibromo-3-chloropropane	N/A	6E-11	2E-10		2E-10	Reproductive	N/A	5E-06	1E-04	1E-04
			Dibromochloromethane	N/A	3E-12	5E-11		5E-11	Liver	N/A	--	8E-06	8E-06
			1,2-Dichlorobenzene	N/A	--	--		--	Liver	N/A	8E-07	1E-04	1E-04
			1,3-Dichlorobenzene	N/A	--	--		--	Endocrine	N/A	--	1E-02	1E-02
			1,4-Dichlorobenzene	N/A	5E-11	1E-09		1E-09	Liver	N/A	2E-06	3E-03	3E-03
			1,1-Dichloroethane	N/A	1E-12	3E-11		3E-11	Kidney; Neurological	N/A	--	2E-06	2E-06
			1,2-Dichloroethane	N/A	3E-11	4E-10		5E-10	Kidney; Neurological	N/A	2E-05	2E-04	2E-04
			1,1-Dichloroethene	N/A	--	--		--	Liver	N/A	9E-05	4E-03	4E-03
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	1E+01	1E+01
			trans-1,2-Dichloroethene	N/A	--	--		--	Blood; Liver	N/A	2E-04	5E-03	6E-03
			Ethylbenzene	N/A	7E-12	1E-09		1E-09	Liver	N/A	3E-07	1E-03	1E-03
			Methylcyclohexane	N/A	--	--		--	Kidney	N/A	5E-07	--	5E-07
			Methylene chloride	N/A	1E-12	4E-11		5E-11	Liver	N/A	2E-06	1E-04	1E-04
			Tetrachloroethene	N/A	7E-10	3E-06		3E-06	Liver	N/A	4E-04	5E-02	5E-02
			1,2,3-Trichlorobenzene	N/A	--	--		--	Developmental; Liver; Endocrine	N/A	--	2E-01	2E-01
			1,2,4-Trichlorobenzene	N/A	--	9E-08		9E-08	Kidney; Blood	N/A	2E-03	3E-02	3E-02
			1,1,2-Trichloroethane	N/A	5E-11	1E-09		1E-09	Liver	N/A	--	6E-03	6E-03
			Trichloroethene	N/A	1E-08	4E-07		4E-07	--	N/A	--	--	--
			o-Xylene	N/A	--	--		--	Developmental	N/A	2E-05	1E-03	1E-03
			Vinyl chloride	N/A	2E-10	2E-07		2E-07	Liver	N/A	5E-04	7E-02	7E-02
			Benzo(a)anthracene	N/A	N/A	8E-08		8E-08	--	N/A	N/A	--	--
			Benzo(a)pyrene	N/A	N/A	7E-07		7E-07	--	N/A	N/A	--	--
			Benzo(b)fluoranthene	N/A	N/A	4E-07		4E-07	--	N/A	N/A	--	--
			Benzo(g,h,i)perylene	N/A	N/A	--		--	--	N/A	N/A	--	--
			Benzo(k)fluoranthene	N/A	N/A	2E-08		2E-08	--	N/A	N/A	--	--
			1,1-Biphenyl	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	6E-04	6E-04
			Dibenzo(a,h)anthracene	N/A	N/A	4E-06		4E-06	--	N/A	N/A	--	--
			Indeno(1,2,3-cd)pyrene	N/A	N/A	8E-08		8E-08	--	N/A	N/A	--	--
			Naphthalene	N/A	1E-11	--		1E-11	Developmental	N/A	1E-04	1E-04	2E-04
			Phenanthrene	N/A	--	--		--	--	N/A	--	--	--
			Total PCB Aroclors	N/A	N/A	1E-06		1E-06	Eye; Developmental; Immunological	N/A	N/A	5E+01	5E+01
			alpha-BHC	N/A	N/A	2E-08		2E-08	--	N/A	N/A	4E-04	4E-04
			delta-BHC	N/A	N/A	--		--	--	N/A	N/A	--	--
			gamma-BHC	N/A	N/A	1E-09		1E-09	Kidney; Liver	N/A	N/A	3E-04	3E-04
			gamma-Chlordane	N/A	N/A	2E-08		2E-08	Liver	N/A	N/A	1E-01	1E-01
			4,4'-DDD	N/A	N/A	1E-08		1E-08	--	N/A	N/A	--	--
			4,4'-DDE	N/A	N/A	4E-08		4E-08	--	N/A	N/A	--	--
			4,4'-DDT	N/A	N/A	1E-07		1E-07	Liver	N/A	N/A	6E-01	6E-01
			Dieldrin	N/A	N/A	7E-08		7E-08	Neurological	N/A	N/A	4E-02	4E-02
			Endosulfan II	N/A	N/A	--		--	--	N/A	N/A	6E-04	6E-04
			Endosulfan sulfate	N/A	N/A	--		--	--	N/A	N/A	--	--
			Endrin aldehyde	N/A	N/A	--		--	--	N/A	N/A	--	--
			Heptachlor	N/A	N/A	2E-08		2E-08	--	N/A	N/A	1E-02	1E-02
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	2E-06		2E-06	Immunological	N/A	N/A	7E-01	7E-01
			Aluminum	N/A	N/A	--		--	Neurological	N/A	N/A	4E-04	4E-04
			Arsenic	N/A	N/A	5E-08		5E-08	Skin, Developmental; Cardiovascular; Neurological	N/A	N/A	1E-01	1E-01
			Barium	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	1E-02	1E-02
			Cadmium	N/A	N/A	--		--	Musculoskeletal	N/A	N/A	3E-02	3E-02
			Chromium	N/A	N/A	3E-07		3E-07	Respiratory	N/A	N/A	3E-02	3E-02
			Cobalt	N/A	N/A	--		--	Endocrine; Respiratory	N/A	N/A	3E-05	3E-05
			Iron	N/A	N/A	--		--	GI tract	N/A	N/A	8E-04	8E-04
			Manganese	N/A	N/A	--		--	--	N/A	N/A	2E-01	2E-01
			Vanadium	N/A	N/A	--		--	--	N/A	N/A	1E-02	1E-02
			Chemical Total	--	1E-08	1E-05		1E-05		--	3E-03	6E+01	6E+01
		Exposure Point Total						1E-05					6E+01
	Exposure Medium Total							1E-05					6E+01
Medium Total								1E-05					6E+01
Receptor Total							Receptor Risk Total	1E-05				Receptor HI Total	6E+01

Notes
N/A - Not Applicable

Blood HI Across All Media =	4E-02
Kidney HI Across All Media =	1E+01
Liver HI Across All Media =	1E+00
Developmental HI Across All Media =	5E+01
Neurological HI Across All Media =	1E-01
Respiratory HI Across All Media =	3E-05
Eye HI Across All Media =	5E+01
Immunological HI Across All Media =	5E+01
Skin HI Across All Media =	1E-01
Cardiovascular HI Across All Media =	1E-01
Endocrine HI Across All Media =	2E-01
GI tract HI Across All Media =	2E-03
Reproductive HI Across All Media =	1E-04
Musculoskeletal HI Across All Media =	3E-02

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, SBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, South of Bound Brook (SBB)	Top of the Groundwater Table	Benzene	N/A	5E-12	4E-10		4E-10	Blood	N/A	2E-06	2E-04	2E-04
			Chloroform	N/A	3E-11	2E-10		3E-10	Liver	N/A	1E-06	2E-05	2E-05
			Dibromochloromethane	N/A	1E-11	2E-10		2E-10	Liver	N/A	--	9E-06	9E-06
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	2E-03	2E-03
			Methyl tert-butyl ether	N/A	6E-11	7E-10			Liver; Neurological	N/A	2E-05	4E-04	4E-04
			Tetrachloroethene	N/A	1E-11	3E-08		3E-08	Liver	N/A	2E-06	2E-04	2E-04
			Trichloroethene	N/A	2E-09	7E-08		8E-08	--	N/A	--	--	--
			Dibenzo(a,h)anthracene	N/A	N/A	3E-05		3E-05	--	N/A	N/A	--	--
			Indeno(1,2,3-cd)pyrene	N/A	N/A	8E-08		8E-08	--	N/A	N/A	--	--
			Naphthalene	N/A	4E-12	--		4E-12	Developmental	N/A	1E-05	8E-06	2E-05
			Total PCB Aroclors	N/A	N/A	2E-06		2E-06	Eye; Developmental; Immunological	N/A	N/A	2E+01	2E+01
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	2E-07		2E-07	Immunological	N/A	N/A	2E-02	2E-02
			Arsenic	N/A	N/A	5E-08		5E-08	Skin, Developmental; Cardiovascular; Neurological	N/A	N/A	3E-02	3E-02
			Barium	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	2E-01	2E-01
			Chromium	N/A	N/A	2E-08		2E-08	Respiratory	N/A	N/A	6E-04	6E-04
			Manganese	N/A	N/A	--		--	--	N/A	N/A	9E-02	9E-02
			Chemical Total	--	2E-09	3E-05		3E-05		--	4E-05	2E+01	2E+01
		Exposure Point Total						3E-05					2E+01
	Exposure Medium Total							3E-05					2E+01
Medium Total								3E-05					2E+01
Receptor Total							Receptor Risk Total	3E-05				Receptor HI Total	2E+01

Notes

N/A - Not Applicable

Blood HI Across All Media =	2E-04
Kidney HI Across All Media =	2E-01
Liver HI Across All Media =	6E-04
Developmental HI Across All Media =	2E+01
Neurological HI Across All Media =	3E-02
Respiratory HI Across All Media =	6E-04
Eye HI Across All Media =	2E+01
Immunological HI Across All Media =	2E+01
Skin HI Across All Media =	3E-02
Cardiovascular HI Across All Media =	3E-02

TABLE 9.3.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, SBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, South of Bound Brook (SBB)	Top of the Groundwater Table	Benzene	N/A	1E-12	1E-10		1E-10	Blood	N/A	2E-06	1E-04	1E-04
			Chloroform	N/A	6E-12	6E-11		7E-11	Liver	N/A	1E-06	2E-05	2E-05
			Dibromochloromethane	N/A	2E-12	5E-11		5E-11	Liver	N/A	--	8E-06	8E-06
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	2E-03	2E-03
			Methyl tert-butyl ether	N/A	1E-11	2E-10			Liver; Neurological	N/A	2E-05	3E-04	3E-04
			Tetrachloroethene	N/A	2E-12	9E-09		9E-09	Liver	N/A	1E-06	2E-04	2E-04
			Trichloroethene	N/A	5E-10	2E-08		2E-08	--	N/A	--	--	--
			Dibenzo(a,h)anthracene	N/A	N/A	8E-06		8E-06	--	N/A	N/A	--	--
			Indeno(1,2,3-cd)pyrene	N/A	N/A	2E-08		2E-08	--	N/A	N/A	--	--
			Naphthalene	N/A	9E-13	--		9E-13	Developmental	N/A	9E-06	7E-06	2E-05
			Total PCB Aroclors	N/A	N/A	5E-07		5E-07	Eye; Developmental; Immunological	N/A	N/A	2E+01	2E+01
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	7E-08		7E-08	Immunological	N/A	N/A	2E-02	2E-02
			Arsenic	N/A	N/A	1E-08		1E-08	Skin, Developmental; Cardiovascular; Neurological	N/A	N/A	3E-02	3E-02
			Barium	N/A	N/A	--		--	Kidney; Developmental	N/A	N/A	1E-01	1E-01
			Chromium	N/A	N/A	5E-09		5E-09	Respiratory	N/A	N/A	5E-04	5E-04
			Manganese	N/A	N/A	--		--	--	N/A	N/A	7E-02	7E-02
			Chemical Total	--	6E-10	8E-06		8E-06		--	3E-05	2E+01	2E+01
		Exposure Point Total						8E-06					2E+01
	Exposure Medium Total							8E-06					2E+01
Medium Total								8E-06					2E+01
Receptor Total							Receptor Risk Total	8E-06				Receptor HI Total	2E+01

Notes
N/A - Not Applicable

Blood HI Across All Media =	1E-04
Kidney HI Across All Media =	1E-01
Liver HI Across All Media =	5E-04
Developmental HI Across All Media =	2E+01
Neurological HI Across All Media =	3E-02
Respiratory HI Across All Media =	5E-04
Eye HI Across All Media =	2E+01
Immunological HI Across All Media =	2E+01
Skin HI Across All Media =	3E-02
Cardiovascular HI Across All Media =	3E-02

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, NBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, North of Bound Brook (NBB)	Top of the Groundwater Table	Benzene	N/A	1E-11	9E-10		9E-10	Blood	N/A	5E-06	4E-04	4E-04
			Bromodichloromethane	N/A	1E-11	1E-10		1E-10	Developmental; Kidney	N/A	5E-06	3E-05	3E-05
			Chloroform	N/A	3E-11	3E-10		3E-10	Liver	N/A	2E-06	3E-05	3E-05
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	6E-03	6E-03
			Tetrachloroethene	N/A	2E-12	7E-09		7E-09	Liver	N/A	4E-07	4E-05	4E-05
			Trichloroethene	N/A	5E-10	2E-08		2E-08	--	N/A	--	--	--
			Vinyl chloride	N/A	2E-12	1E-09		1E-09	Liver	N/A	2E-06	2E-04	2E-04
			Benzo(g,h,i)perylene	N/A	N/A	--			--	N/A	N/A	--	--
			bis(2-Ethylhexyl)phthalate	N/A	N/A	5E-09		5E-09	Liver	N/A	N/A	6E-04	6E-04
			Indeno(1,2,3-cd)pyrene	N/A	N/A	9E-08		9E-08	--	N/A	N/A	--	--
			Naphthalene	N/A	3E-12	--		3E-12	Developmental	N/A	1E-05	7E-06	2E-05
			Total PCB Aroclors	N/A	N/A	2E-07		2E-07	Eye; Developmental; Immunological	N/A	N/A	2E+00	2E+00
			beta-BHC	N/A	N/A	1E-08			Liver	N/A	N/A	4E-03	4E-03
			delta-BHC	N/A	N/A	--			--	N/A	N/A	--	--
			4,4'-DDD	N/A	N/A	6E-08		6E-08	--	N/A	N/A	--	--
			4,4'-DDE	N/A	N/A	7E-08		7E-08	--	N/A	N/A	--	--
			4,4'-DDT	N/A	N/A	2E-07		2E-07	Liver	N/A	N/A	3E-01	3E-01
			Heptachlor	N/A	N/A	2E-08		2E-08	--	N/A	N/A	3E-03	3E-03
			Antimony	N/A	N/A	--			Blood	N/A	N/A	1E-02	1E-02
			Arsenic	N/A	N/A	1E-07		1E-07	Skin; Developmental; Cardiovascular; Neurological	N/A	N/A	1E-01	1E-01
			Chromium	N/A	N/A	4E-08		4E-08	Respiratory	N/A	N/A	1E-03	1E-03
			Cobalt	N/A	N/A	--		--	Endocrine; Respiratory	N/A	N/A	2E-05	2E-05
			Manganese	N/A	N/A	--		--	--	N/A	N/A	2E-01	2E-01
			Vanadium	N/A	N/A	--		--	--	N/A	N/A	2E-02	2E-02
			Chemical Total	--	5E-10	8E-07		8E-07		--	2E-05	3E+00	3E+00
		Exposure Point Total						8E-07					3E+00
	Exposure Medium Total							8E-07					3E+00
Medium Total								8E-07					3E+00
Receptor Total							Receptor Risk Total	8E-07				Receptor HI Total	3E+00

Notes

N/A - Not Applicable

Blood HI Across All Media =	1E-02
Kidney HI Across All Media =	6E-03
Liver HI Across All Media =	3E-01
Developmental HI Across All Media =	2E+00
Neurological HI Across All Media =	1E-01
Respiratory HI Across All Media =	1E-03
Eye HI Across All Media =	2E+00
Immunological HI Across All Media =	2E+00
Skin HI Across All Media =	1E-01
Cardiovascular HI Across All Media =	1E-01
Endocrine HI Across All Media =	2E-05

TABLE 9.4.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, NBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, North of Bound Brook (NBB)	Top of the Groundwater Table	Benzene	N/A	3E-12	2E-10		2E-10	Blood	N/A	4E-06	3E-04	4E-04
			Bromodichloromethane	N/A	3E-12	3E-11		3E-11	Developmental; Kidney	N/A	4E-06	2E-05	3E-05
			Chloroform	N/A	8E-12	8E-11		9E-11	Liver	N/A	1E-06	2E-05	3E-05
			cis-1,2-Dichloroethene	N/A	--	--		--	Kidney	N/A	--	4E-03	4E-03
			Tetrachloroethene	N/A	5E-13	2E-09		2E-09	Liver	N/A	3E-07	3E-05	3E-05
			Trichloroethene	N/A	1E-10	4E-09		4E-09	--	N/A	--	--	--
			Vinyl chloride	N/A	5E-13	3E-10		3E-10	Liver	N/A	1E-06	2E-04	2E-04
			Benzo(g,h,i)perylene	N/A	N/A	--			--	N/A	N/A	--	--
			bis(2-Ethylhexyl)phthalate	N/A	N/A	1E-09		1E-09	Liver	N/A	N/A	5E-04	5E-04
			Indeno(1,2,3-cd)pyrene	N/A	N/A	3E-08		3E-08	--	N/A	N/A	--	--
			Naphthalene	N/A	8E-13	--		8E-13	Developmental	N/A	8E-06	6E-06	1E-05
			Total PCB Aroclors	N/A	N/A	5E-08		5E-08	Eye; Developmental; Immunological	N/A	N/A	2E+00	2E+00
			beta-BHC	N/A	N/A	3E-09			Liver	N/A	N/A	3E-03	3E-03
			delta-BHC	N/A	N/A	--			--	N/A	N/A	--	--
			4,4'-DDD	N/A	N/A	2E-08		2E-08	--	N/A	N/A	--	--
			4,4'-DDE	N/A	N/A	2E-08		2E-08	--	N/A	N/A	--	--
			4,4'-DDT	N/A	N/A	5E-08		5E-08	Liver	N/A	N/A	3E-01	3E-01
			Heptachlor	N/A	N/A	6E-09		6E-09	--	N/A	N/A	2E-03	2E-03
			Antimony	N/A	N/A	--			Blood	N/A	N/A	8E-03	8E-03
			Arsenic	N/A	N/A	4E-08		4E-08	Skin; Developmental; Cardiovascular; Neurological	N/A	N/A	8E-02	8E-02
			Chromium	N/A	N/A	1E-08		1E-08	Respiratory	N/A	N/A	1E-03	1E-03
			Cobalt	N/A	N/A	--		--	Endocrine; Respiratory	N/A	N/A	1E-05	1E-05
			Manganese	N/A	N/A	--		--	--	N/A	N/A	1E-01	1E-01
			Vanadium	N/A	N/A	--		--	--	N/A	N/A	1E-02	1E-02
			Chemical Total	--	1E-10	2E-07		2E-07		--	2E-05	3E+00	3E+00
		Exposure Point Total						2E-07					3E+00
	Exposure Medium Total							2E-07					3E+00
Medium Total								2E-07					3E+00
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	3E+00

Notes
N/A - Not Applicable

Blood HI Across All Media =	8E-03
Kidney HI Across All Media =	5E-03
Liver HI Across All Media =	3E-01
Developmental HI Across All Media =	2E+00
Neurological HI Across All Media =	8E-02
Respiratory HI Across All Media =	1E-03
Eye HI Across All Media =	2E+00
Immunological HI Across All Media =	2E+00
Skin HI Across All Media =	8E-02
Cardiovascular HI Across All Media =	8E-02
Endocrine HI Across All Media =	1E-05

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	Benzene	6E-07	4E-07	N/A		1E-06	Blood	5E-03	3E-03	N/A	8E-03
			Bromodichloromethane	4E-07	1E-06	N/A		2E-06	Kidney	6E-04	--	N/A	6E-04
			Chlorobenzene	--	--	--		--	Kidney; Liver	5E-03	9E-03	1E-03	2E-02
			Chloroform	1E-06	5E-06	N/A		6E-06	Liver	8E-03	4E-03	N/A	1E-02
			Dibromochloromethane	4E-07	7E-07	N/A		1E-06	Liver	5E-04	--	N/A	5E-04
			1,2-Dichlorobenzene	--	--	--		--	Developmental	7E-04	1E-03	3E-04	2E-03
			1,3-Dichlorobenzene	--	--	--		--	--	--	--	--	--
			1,4-Dichlorobenzene	4E-07	4E-06	2E-07		5E-06	Liver	2E-03	8E-04	8E-04	4E-03
			1,1-Dichloroethane	6E-08	9E-08	N/A		1E-07	Kidney; Neurological	1E-04	--	N/A	1E-04
			1,2-Dichloroethane	8E-07	1E-06	N/A		2E-06	Neurological	--	1E-02	N/A	1E-02
			1,1-Dichloroethene	--	--	N/A		--	Liver	3E-03	4E-03	N/A	7E-03
			cis-1,2-Dichloroethene	--	--	N/A		--	Kidney	2E+02	--	N/A	2E+02
			trans-1,2-Dichloroethene	--	--	N/A		--	Blood; Liver; Respiratory	8E-02	1E-01	N/A	2E-01
			Methyl tert-butyl ether	3E-07	3E-07	N/A		6E-07	Kidney; Liver	--	5E-04	N/A	5E-04
			Methylene chloride	6E-08	2E-08	N/A		7E-08	Liver	2E-04	6E-05	N/A	3E-04
			Tetrachloroethene	3E-04	2E-05	1E-04		4E-04	Liver; Neurological	1E-01	2E-02	4E-02	2E-01
			1,2,3-Trichlorobenzene	--	--	--		--	--	--	--	--	--
			1,2,4-Trichlorobenzene	3E-05	--	2E-05		4E-05	Kidney; Blood	2E-01	4E+00	1E-01	4E+00
			1,1,2-Trichloroethane	3E-06	5E-06	N/A		8E-06	Blood	3E-02	--	N/A	3E-02
			Trichloroethene	6E-04	1E-03	6E-05		2E-03	--	--	--	--	--
			Vinyl chloride	1E-03	4E-05	N/A		1E-03	Liver	5E-01	7E-02	N/A	6E-01
			bis(2-Ethylhexyl)phthalate	1E-06	N/A	1E-06		2E-06	Liver	8E-03	N/A	8E-03	2E-02
			Dibenzo(a,h)anthracene	3E-05	N/A	3E-04		3E-04	--	--	N/A	--	--
			Indeno(1,2,3-cd)pyrene	2E-06	N/A	2E-05		2E-05	--	--	N/A	--	--
			Naphthalene	--	9E-07	--		9E-07	Developmental	5E-04	1E-02	2E-04	2E-02
			Total PCB Aroclors	3E-05	N/A	3E-04		4E-04	Eye; Developmental; Immunological	6E+00	N/A	8E+01	8E+01
			gamma-Chlordane	4E-06	N/A	6E-06		1E-05	Liver	4E-02	N/A	6E-02	1E-01
			4,4'-DDD	8E-07	N/A	4E-06		5E-06	--	--	N/A	--	--
			4,4'-DDE	1E-06	N/A	5E-06		7E-06	--	--	N/A	--	--
			4,4'-DDT	2E-06	N/A	2E-05		2E-05	Liver	3E-02	N/A	2E-01	2E-01
			Heptachlor	2E-04	N/A	7E-05		3E-04	Liver	2E-01	N/A	6E-02	3E-01
			2,3,7,8-TCDD Toxic Equivalence	6E-05	N/A	8E-04		9E-04	Developmental	7E-01	N/A	1E+01	1E+01
			Aluminum	--	N/A	--		--	Neurological	7E-03	N/A	2E-05	7E-03
			Arsenic	2E-03	N/A	4E-06		2E-03	Skin; Developmental; Cardiovascular; Neurological	7E+00	N/A	2E-02	7E+00
			Barium	--	N/A	--		--	Kidney; Developmental	7E-02	N/A	2E-03	8E-02
			Cadmium	--	N/A	--		--	Kidney	3E-02	N/A	1E-03	3E-02
			Chromium	2E-05	N/A	2E-06		3E-05	Respiratory	2E-02	N/A	4E-03	2E-02
			Cobalt	--	N/A	--		--	Endocrine; Respiratory	4E-02	N/A	3E-05	4E-02
			Iron	--	N/A	--		--	GI tract	2E-02	N/A	5E-05	2E-02
			Manganese	--	N/A	--		--	Neurological	4E-01	N/A	2E-02	4E-01
			Vanadium	--	N/A	--		--	--	4E-02	N/A	4E-03	4E-02
			Chemical Total	4E-03	1E-03	2E-03		7E-03		2E+02	4E+00	9E+01	3E+02
		Exposure Point Total						7E-03					3E+02
	Exposure Medium Total							7E-03					3E+02
Medium Total								7E-03					3E+02
Receptor Total							Receptor Risk Total	7E-03				Receptor HI Total	3E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	4E+00
Kidney HI Across All Media =	2E+02
Liver HI Across All Media =	2E+00
Developmental HI Across All Media =	1E+02
Neurological HI Across All Media =	8E+00
Respiratory HI Across All Media =	3E-01
Eye HI Across All Media =	8E+01
Immunological HI Across All Media =	8E+01
Skin HI Across All Media =	7E+00
Cardiovascular HI Across All Media =	7E+00
Endocrine HI Across All Media =	4E-02
GI tract HI Across All Media =	2E-02

TABLE 9.5.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	Benzene	7E-08	2E-08	5E-09		9E-08	Blood	2E-03	6E-04	4E-04	3E-03
			Bromodichloromethane	4E-08	5E-08	N/A		9E-08	Kidney	3E-04	--	N/A	3E-04
			Chlorobenzene	--	--	--		--	Kidney; Liver	3E-03	2E-03	4E-04	5E-03
			Chloroform	2E-07	2E-07	N/A		3E-07	Liver	4E-03	7E-04	N/A	4E-03
			Dibromochloromethane	5E-08	3E-08	N/A		8E-08	Liver	2E-04	--	N/A	2E-04
			1,2-Dichlorobenzene	--	--	--		--	Developmental	3E-04	3E-04	9E-05	7E-04
			1,3-Dichlorobenzene	--	--	--		--	--	--	--	--	--
			1,4-Dichlorobenzene	5E-08	2E-07	1E-08		2E-07	Liver	1E-03	2E-04	3E-04	1E-03
			1,1-Dichloroethane	7E-09	3E-09	N/A		1E-08	Kidney; Neurological	5E-05	--	N/A	5E-05
			1,2-Dichloroethane	9E-08	4E-08	N/A		1E-07	Neurological	--	2E-03	N/A	2E-03
			1,1-Dichloroethene	--	--	--		--	Liver	2E-03	7E-04	9E-05	2E-03
			cis-1,2-Dichloroethene	--	--	N/A		--	Kidney	1E+02	--	N/A	1E+02
			trans-1,2-Dichloroethene	--	--	N/A		--	Blood; Liver; Respiratory	4E-02	2E-02	N/A	7E-02
			Methyl tert-butyl ether	4E-08	1E-08	N/A		5E-08	Kidney; Liver	--	1E-04	N/A	1E-04
			Methylene chloride	7E-09	7E-10	N/A		7E-09	Liver	1E-04	1E-05	N/A	1E-04
			Tetrachloroethene	3E-05	7E-07	9E-06		4E-05	Liver; Neurological	5E-02	3E-03	1E-02	7E-02
			1,2,3-Trichlorobenzene	--	--	--		--	--	--	--	--	--
			1,2,4-Trichlorobenzene	3E-06	--	2E-06		5E-06	Kidney; Blood	8E-02	7E-01	5E-02	8E-01
			1,1,2-Trichloroethane	4E-07	2E-07	N/A		6E-07	Blood	1E-02	--	N/A	1E-02
			Trichloroethene	7E-05	4E-05	5E-06		1E-04	--	--	--	--	--
			Vinyl chloride	1E-04	1E-06	N/A		1E-04	Liver	2E-01	1E-02	N/A	3E-01
			bis(2-Ethylhexyl)phthalate	1E-07	N/A	2E-07		3E-07	Liver	4E-03	N/A	5E-03	9E-03
			Dibenzo(a,h)anthracene	2E-06	N/A	7E-05		7E-05	--	--	N/A	--	--
			Indeno(1,2,3-cd)pyrene	2E-07	N/A	4E-06		4E-06	--	--	N/A	--	--
			Naphthalene	--	4E-08	--		4E-08	Developmental	2E-04	3E-03	7E-05	3E-03
			Total PCB Aroclors	3E-06	N/A	5E-05		6E-05	Eye; Developmental; Immunological	3E+00	N/A	5E+01	5E+01
			gamma-Chlordane	5E-07	N/A	9E-07		1E-06	Liver	2E-02	N/A	4E-02	6E-02
			4,4'-DDD	1E-07	N/A	6E-07		7E-07	--	--	N/A	--	--
			4,4'-DDE	2E-07	N/A	9E-07		1E-06	--	--	N/A	--	--
			4,4'-DDT	3E-07	N/A	3E-06		3E-06	Liver	1E-02	N/A	1E-01	1E-01
			Heptachlor	3E-05	N/A	1E-05		4E-05	Liver	1E-01	N/A	4E-02	1E-01
			2,3,7,8-TCDD Toxic Equivalence	7E-06	N/A	1E-04		1E-04	Developmental	4E-01	N/A	6E+00	7E+00
			Aluminum	--	N/A	--		--	Neurological	4E-03	N/A	7E-06	4E-03
			Arsenic	2E-04	N/A	4E-07		2E-04	Skin; Developmental; Cardiovascular; Neurological	3E+00	N/A	7E-03	3E+00
			Barium	--	N/A	--		--	Kidney; Developmental	4E-02	N/A	1E-03	4E-02
			Cadmium	--	N/A	--		--	Kidney	2E-02	N/A	6E-04	2E-02
			Chromium	2E-06	N/A	3E-07		2E-06	Respiratory	1E-02	N/A	2E-03	1E-02
			Cobalt	--	N/A	--		--	Endocrine; Respiratory	2E-02	N/A	2E-05	2E-02
			Iron	--	N/A	--		--	GI tract	1E-02	N/A	2E-05	1E-02
			Manganese	--	N/A	--		--	Neurological	2E-01	N/A	9E-03	2E-01
			Vanadium	--	N/A	--		--	--	2E-02	N/A	2E-03	2E-02
			Chemical Total	5E-04	5E-05	3E-04		8E-04		1E+02	8E-01	6E+01	2E+02
		Exposure Point Total						8E-04					2E+02
	Exposure Medium Total							8E-04					2E+02
Medium Total								8E-04					2E+02
Receptor Total							Receptor Risk Total	8E-04				Receptor HI Total	2E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	9E-01
Kidney HI Across All Media =	1E+02
Liver HI Across All Media =	8E-01
Developmental HI Across All Media =	6E+01
Neurological HI Across All Media =	4E+00
Respiratory HI Across All Media =	1E-01
Eye HI Across All Media =	5E+01
Immunological HI Across All Media =	5E+01
Skin HI Across All Media =	3E+00
Cardiovascular HI Across All Media =	3E+00
Endocrine HI Across All Media =	2E-02
GI tract HI Across All Media =	1E-02

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	Benzene	2E-07	2E-07	N/A		4E-07	Blood	1E-02	9E-03	N/A	2E-02
			Bromodichloromethane	1E-07	5E-07	N/A		6E-07	Kidney	1E-03	--	N/A	1E-03
			Chlorobenzene	--	--	--		--	Kidney; Liver	1E-02	3E-02	2E-03	4E-02
			Chloroform	5E-07	2E-06	N/A		3E-06	Liver	2E-02	1E-02	N/A	3E-02
			Dibromochloromethane	2E-07	3E-07	N/A		5E-07	Liver	1E-03	--	N/A	1E-03
			1,2-Dichlorobenzene	--	--	--		--	Developmental	2E-03	4E-03	6E-04	6E-03
			1,3-Dichlorobenzene	--	--	--		--	--	--	--	--	--
			1,4-Dichlorobenzene	1E-07	2E-06	6E-08		2E-06	Liver	5E-03	2E-03	2E-03	9E-03
			1,1-Dichloroethane	2E-08	4E-08	N/A		6E-08	Kidney; Neurological	2E-04	--	N/A	2E-04
			1,2-Dichloroethane	3E-07	5E-07	N/A		8E-07	Neurological	--	3E-02	N/A	3E-02
			1,1-Dichloroethene	--	--	N/A		--	Liver	7E-03	1E-02	N/A	2E-02
			cis-1,2-Dichloroethene	--	--	N/A		--	Kidney	5E+02	--	N/A	5E+02
			trans-1,2-Dichloroethene	--	--	N/A		--	Blood; Liver; Respiratory	2E-01	4E-01	N/A	6E-01
			Methyl tert-butyl ether	1E-07	1E-07	N/A		2E-07	Kidney; Liver	--	2E-03	N/A	2E-03
			Methylene chloride	2E-08	8E-09	N/A		3E-08	Liver	5E-04	2E-04	N/A	7E-04
			Tetrachloroethene	1E-04	7E-06	4E-05		2E-04	Liver; Neurological	2E-01	5E-02	8E-02	4E-01
			1,2,3-Trichlorobenzene	--	--	--		--	--	--	--	--	--
			1,2,4-Trichlorobenzene	9E-06	--	7E-06		2E-05	Kidney; Blood	4E-01	1E+01	3E-01	1E+01
			1,1,2-Trichloroethane	1E-06	2E-06	N/A		3E-06	Blood	6E-02	--	N/A	6E-02
			Trichloroethene	2E-04	5E-04	2E-05		7E-04	--	--	--	--	--
			Vinyl chloride	4E-04	2E-05	N/A		5E-04	Liver	1E+00	2E-01	N/A	1E+00
			bis(2-Ethylhexyl)phthalate	4E-07	N/A	4E-07		9E-07	Liver	2E-02	N/A	2E-02	4E-02
			Dibenzo(a,h)anthracene	2E-05	N/A	3E-04		4E-04	--	--	N/A	--	--
			Indeno(1,2,3-cd)pyrene	2E-06	N/A	2E-05		2E-05	--	--	N/A	--	--
			Naphthalene	--	4E-07	--		4E-07	Developmental	1E-03	4E-02	4E-04	5E-02
			Total PCB Aroclors	1E-05	N/A	1E-04		1E-04	Eye; Developmental; Immunological	1E+01	N/A	2E+02	2E+02
			gamma-Chlordane	1E-06	N/A	2E-06		4E-06	Liver	1E-01	N/A	1E-01	2E-01
			4,4'-DDD	3E-07	N/A	1E-06		2E-06	--	--	N/A	--	--
			4,4'-DDE	5E-07	N/A	2E-06		2E-06	--	--	N/A	--	--
			4,4'-DDT	9E-07	N/A	7E-06		8E-06	Liver	6E-02	N/A	5E-01	5E-01
			Heptachlor	9E-05	N/A	3E-05		1E-04	Liver	5E-01	N/A	1E-01	6E-01
			2,3,7,8-TCDD Toxic Equivalence	2E-05	N/A	3E-04		3E-04	Developmental	2E+00	N/A	2E+01	2E+01
			Aluminum	--	N/A	--		--	Neurological	2E-02	N/A	5E-05	2E-02
			Arsenic	6E-04	N/A	2E-06		6E-04	Skin; Developmental; Cardiovascular; Neurological	2E+01	N/A	5E-02	2E+01
			Barium	--	N/A	--		--	Kidney; Developmental	2E-01	N/A	7E-03	2E-01
			Cadmium	--	N/A	--		--	Kidney	7E-02	N/A	4E-03	8E-02
			Chromium	2E-05	N/A	3E-06		2E-05	Respiratory	5E-02	N/A	1E-02	6E-02
			Cobalt	--	N/A	--		--	Endocrine; Respiratory	9E-02	N/A	1E-04	9E-02
			Iron	--	N/A	--		--	GI tract	5E-02	N/A	1E-04	5E-02
			Manganese	--	N/A	--		--	Neurological	8E-01	N/A	6E-02	9E-01
			Vanadium	--	N/A	--		--	--	9E-02	N/A	1E-02	1E-01
			Chemical Total	2E-03	5E-04	9E-04		3E-03		5E+02	1E+01	2E+02	7E+02
		Exposure Point Total						3E-03					7E+02
	Exposure Medium Total							3E-03					7E+02
Medium Total								3E-03					7E+02
Receptor Total							Receptor Risk Total	3E-03				Receptor HI Total	7E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	1E+01
Kidney HI Across All Media =	5E+02
Liver HI Across All Media =	4E+00
Developmental HI Across All Media =	2E+02
Neurological HI Across All Media =	2E+01
Respiratory HI Across All Media =	7E-01
Eye HI Across All Media =	2E+02
Immunological HI Across All Media =	2E+02
Skin HI Across All Media =	2E+01
Cardiovascular HI Across All Media =	2E+01
Endocrine HI Across All Media =	9E-02
GI tract HI Across All Media =	5E-02

TABLE 9.6.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	Benzene	1E-07	2E-08	6E-09		1E-07	Blood	6E-03	1E-03	5E-09	7E-03
			Bromodichloromethane	7E-08	6E-08	N/A		1E-07	Kidney	6E-04	--	N/A	6E-04
			Chlorobenzene	--	--	--		--	Kidney; Liver	6E-03	3E-03	8E-04	1E-02
			Chloroform	2E-07	2E-07	N/A		5E-07	Liver	9E-03	1E-03	N/A	1E-02
			Dibromochloromethane	8E-08	3E-08	N/A		1E-07	Liver	5E-04	--	N/A	5E-04
			1,2-Dichlorobenzene	--	--	--		--	Developmental	8E-04	5E-04	2E-04	1E-03
			1,3-Dichlorobenzene	--	--	--		--	--	--	--	--	--
			1,4-Dichlorobenzene	7E-08	2E-07	2E-08		3E-07	Liver	2E-03	3E-04	6E-04	3E-03
			1,1-Dichloroethane	1E-08	4E-09	N/A		2E-08	Kidney; Neurological	1E-04	--	N/A	1E-04
			1,2-Dichloroethane	1E-07	5E-08	N/A		2E-07	Neurological	--	3E-03	N/A	3E-03
			1,1-Dichloroethene	--	--	--		--	Liver	4E-03	1E-03	2E-04	5E-03
			cis-1,2-Dichloroethene	--	--	N/A		--	Kidney	2E+02	--	N/A	2E+02
			trans-1,2-Dichloroethene	--	--	N/A		--	Blood; Liver; Respiratory	1E-01	4E-02	N/A	1E-01
			Methyl tert-butyl ether	6E-08	1E-08	N/A		7E-08	Kidney; Liver	--	2E-04	N/A	2E-04
			Methylene chloride	1E-08	9E-10	N/A		1E-08	Liver	3E-04	2E-05	N/A	3E-04
			Tetrachloroethene	5E-05	8E-07	1E-05		7E-05	Liver; Neurological	1E-01	6E-03	3E-02	1E-01
			1,2,3-Trichlorobenzene	--	--	--		--	--	--	--	--	--
			1,2,4-Trichlorobenzene	5E-06	--	2E-06		7E-06	Kidney; Blood	2E-01	1E+00	9E-02	2E+00
			1,1,2-Trichloroethane	6E-07	2E-07	N/A		8E-07	Blood	3E-02	--	N/A	3E-02
			Trichloroethene	1E-04	5E-05	7E-06		2E-04	--	--	--	--	--
			Vinyl chloride	2E-04	2E-06	N/A		2E-04	Liver	6E-01	2E-02	N/A	6E-01
			bis(2-Ethylhexyl)phthalate	2E-07	N/A	3E-07		5E-07	Liver	9E-03	N/A	1E-02	2E-02
			Dibenzo(a,h)anthracene	1E-05	N/A	2E-04		2E-04	--	--	N/A	--	--
			Indeno(1,2,3-cd)pyrene	1E-06	N/A	1E-05		1E-05	--	--	N/A	--	--
			Naphthalene	--	4E-08	--		4E-08	Developmental	5E-04	5E-03	1E-04	6E-03
			Total PCB Aroclors	5E-06	N/A	7E-05		8E-05	Eye; Developmental; Immunological	7E+00	N/A	1E+02	1E+02
			gamma-Chlordane	7E-07	N/A	1E-06		2E-06	Liver	5E-02	N/A	8E-02	1E-01
			4,4'-DDD	1E-07	N/A	8E-07		9E-07	--	--	N/A	--	--
			4,4'-DDE	3E-07	N/A	1E-06		1E-06	--	--	N/A	--	--
			4,4'-DDT	5E-07	N/A	4E-06		4E-06	Liver	3E-02	N/A	3E-01	3E-01
			Heptachlor	4E-05	N/A	2E-05		6E-05	Liver	2E-01	N/A	8E-02	3E-01
			2,3,7,8-TCDD Toxic Equivalence	1E-05	N/A	2E-04		2E-04	Developmental	8E-01	N/A	1E+01	1E+01
			Aluminum	--	N/A	--		--	Neurological	9E-03	N/A	2E-05	9E-03
			Arsenic	3E-04	N/A	6E-07		3E-04	Skin; Developmental; Cardiovascular; Neurological	8E+00	N/A	2E-02	8E+00
			Barium	--	N/A	--		--	Kidney; Developmental	9E-02	N/A	2E-03	9E-02
			Cadmium	--	N/A	--		--	Kidney	4E-02	N/A	1E-03	4E-02
			Chromium	1E-05	N/A	1E-06		1E-05	Respiratory	2E-02	N/A	4E-03	3E-02
			Cobalt	--	N/A	--		--	Endocrine; Respiratory	4E-02	N/A	4E-05	4E-02
			Iron	--	N/A	--		--	GI tract	2E-02	N/A	5E-05	2E-02
			Manganese	--	N/A	--		--	Neurological	4E-01	N/A	2E-02	4E-01
			Vanadium	--	N/A	--		--	--	5E-02	N/A	4E-03	5E-02
			Chemical Total	8E-04	6E-05	5E-04		1E-03		2E+02	1E+00	1E+02	4E+02
		Exposure Point Total						1E-03					4E+02
	Exposure Medium Total							1E-03					4E+02
Medium Total								1E-03					4E+02
Receptor Total							Receptor Risk Total	1E-03				Receptor HI Total	4E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	2E+00
Kidney HI Across All Media =	2E+02
Liver HI Across All Media =	2E+00
Developmental HI Across All Media =	1E+02
Neurological HI Across All Media =	9E+00
Respiratory HI Across All Media =	2E-01
Eye HI Across All Media =	1E+02
Immunological HI Across All Media =	1E+02
Skin HI Across All Media =	8E+00
Cardiovascular HI Across All Media =	8E+00
Endocrine HI Across All Media =	4E-02
GI tract HI Across All Media =	2E-02

TABLE 10.1.RME
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Process Water	cis-1,2-Dichloroethene						Kidney	N/A	--	1E+01	1E+01
			1,2,4-Trichlorobenzene						Kidney; Blood	N/A	1E+01	1E-01	1E+01
			Trichloroethene	N/A	2E-03	4E-05		3E-03					
			Dibenzo(a,h)anthracene	N/A	N/A	2E-04		2E-04					
			Total PCB Aroclors	N/A	N/A	2E-04		2E-04	Eye; Developmental; Immunological	N/A	N/A	6E+01	6E+01
			2,3,7,8-TCDD Toxic Equivalence	N/A	N/A	4E-04		4E-04	Developmental	N/A	N/A	7E+00	7E+00
			Chemical Total	--	--	8E-04		3E-03		--	1E+01	8E+01	9E+01
		Exposure Point Total						3E-03					9E+01
	Exposure Medium Total							3E-03					9E+01
Medium Total								3E-03					9E+01
Receptor Total							Receptor Risk Total	3E-03				Receptor HI Total	9E+01

Notes

N/A - Not Applicable

Blood HI Across All Media =	1E+01
Kidney HI Across All Media =	3E+01
Developmental HI Across All Media =	7E+00
Eye HI Across All Media =	6E+01
Immunological HI Across All Media =	6E+01

TABLE 10.1.CT
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Process Water	cis-1,2-Dichloroethene						Kidney	N/A	--	6E+00	6E+00
			1,2,4-Trichlorobenzene						Kidney; Blood	N/A	8E+00	5E-02	8E+00
			Trichloroethene	N/A	4E-04	5E-06		4E-04					
			Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	5E+01	5E+01
			2,3,7,8-TCDD Toxic Equivalence						Developmental	N/A	N/A	6E+00	6E+00
			Chemical Total	--	4E-04	5E-06		4E-04		--	8E+00	6E+01	7E+01
		Exposure Point Total						4E-04					7E+01
	Exposure Medium Total							4E-04					7E+01
Medium Total								4E-04					7E+01
Receptor Total							Receptor Risk Total	4E-04				Receptor HI Total	7E+01

Notes

N/A - Not Applicable

Blood HI Across All Media =	8E+00
Kidney HI Across All Media =	1E+01
Developmental HI Across All Media =	6E+00
Eye HI Across All Media =	5E+01
Immunological HI Across All Media =	5E+01

TABLE 10.2.RME
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Onsite Groundwater	Top of the Groundwater Table	cis-1,2-Dichloroethene						Kidney	N/A	--	2E+01	2E+01
			Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	5E+01	5E+01
			Chemical Total							--	--	7E+01	7E+01
		Exposure Point Total											7E+01
	Exposure Medium Total												7E+01
Medium Total													7E+01
Receptor Total								Receptor Risk Total				Receptor HI Total	7E+01

Notes

Kidney HI Across All Media =	2E+01
Developmental HI Across All Media =	5E+01
Eye HI Across All Media =	5E+01

TABLE 10.2.CT
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Onsite Groundwater
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Onsite Groundwater	Top of the Groundwater Table	cis-1,2-Dichloroethene						Kidney	N/A	--	1E+01	1E+01
			Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	5E+01	5E+01
			Chemical Total							--	--	6E+01	6E+01
		Exposure Point Total											6E+01
	Exposure Medium Total												6E+01
Medium Total													6E+01
Receptor Total							Receptor Risk Total					Receptor HI Total	6E+01

Notes

Kidney HI Across All Media =	1E+01
Developmental HI Across All Media =	5E+01
Eye HI Across All Media =	5E+01

TABLE 10.3.RME
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, SBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, South of Bound Brook (SBB)	Top of the Groundwater Table	Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	2E+01	2E+01
			Chemical Total									2E+01	2E+01
		Exposure Point Total											2E+01
	Exposure Medium Total												2E+01
Medium Total													2E+01
Receptor Total							Receptor Risk Total					Receptor HI Total	2E+01

Notes
N/A - Not Applicable

Developmental HI Across All Media =	2E+01
Eye HI Across All Media =	2E+01
Immunological HI Across All Media =	2E+01

TABLE 10.3.CT
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, SBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, South of Bound Brook (SBB)	Top of the Groundwater Table	Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	2E+01	2E+01
			Chemical Total							--	--	2E+01	2E+01
		Exposure Point Total											2E+01
	Exposure Medium Total												2E+01
Medium Total													2E+01
Receptor Total							Receptor Risk Total					Receptor HI Total	2E+01

Notes

N/A - Not Applicable

Developmental HI Across All Media =	2E+01
Eye HI Across All Media =	2E+01
Immunological HI Across All Media =	2E+01

TABLE 10.4.RME
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, NBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, North of Bound Brook (NBB)	Top of the Groundwater Table	Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	2E+00	2E+00
			Chemical Total									2E+00	2E+00
		Exposure Point Total											2E+00
	Exposure Medium Total												2E+00
Medium Total													2E+00
Receptor Total							Receptor Risk Total					Receptor HI Total	2E+00

Notes

N/A - Not Applicable

Developmental HI Across All Media =	2E+00
Eye HI Across All Media =	2E+00
Immunological HI Across All Media =	2E+00

TABLE 10.4.CT
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Shallow Offsite Groundwater, NBB
Receptor Population:	Construction/Utility Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shallow Offsite Groundwater, North of Bound Brook (NBB)	Top of the Groundwater Table	Total PCB Aroclors						Eye; Developmental; Immunological	N/A	N/A	2E+00	2E+00
			Chemical Total							--	--	2E+00	2E+00
		Exposure Point Total											2E+00
	Exposure Medium Total												2E+00
Medium Total													2E+00
Receptor Total							Receptor Risk Total					Receptor HI Total	2E+00

Notes
N/A - Not Applicable

Developmental HI Across All Media =	2E+00
Eye HI Across All Media =	2E+00
Immunological HI Across All Media =	2E+00

TABLE 10.5.RME
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	cis-1,2-Dichloroethene						Kidney	2E+02	--	N/A	2E+02
			Tetrachloroethene	3E-04	2E-05	1E-04		4E-04					
			1,2,4-Trichlorobenzene						Kidney; Blood	2E-01	4E+00	1E-01	4E+00
			Trichloroethene	6E-04	1E-03	6E-05		2E-03					
			Vinyl chloride	1E-03	4E-05	N/A		1E-03					
			Dibenzo(a,h)anthracene	3E-05	N/A	3E-04		3E-04					
			Total PCB Aroclors	3E-05	N/A	3E-04		4E-04	Eye; Developmental; Immunological	6E+00	N/A	8E+01	8E+01
			Heptachlor	2E-04	N/A	7E-05		3E-04					
			2,3,7,8-TCDD Toxic Equivalence	6E-05	N/A	8E-04		9E-04	Developmental	7E-01	N/A	1E+01	1E+01
			Arsenic	2E-03	N/A	4E-06		2E-03	Skin; Developmental; Cardiovascular; Neurological	7E+00	N/A	2E-02	7E+00
			Chemical Total	4E-03	1E-03	2E-03		7E-03		2E+02	4E+00	9E+01	3E+02
		Exposure Point Total						7E-03					3E+02
	Exposure Medium Total							7E-03					3E+02
Medium Total								7E-03					3E+02
Receptor Total							Receptor Risk Total	7E-03				Receptor HI Total	3E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	4E+00
Kidney HI Across All Media =	2E+02
Developmental HI Across All Media =	1E+02
Neurological HI Across All Media =	7E+00
Eye HI Across All Media =	8E+01
Immunological HI Across All Media =	8E+01
Skin HI Across All Media =	7E+00

TABLE 10.5.CT
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	cis-1,2-Dichloroethene						Kidney	1E+02	--	N/A	1E+02
			Total PCB Aroclors						Eye; Developmental; Immunological	3E+00	N/A	5E+01	5E+01
			2,3,7,8-TCDD Toxic Equivalence						Developmental	4E-01	N/A	6E+00	7E+00
			Arsenic	2E-04	N/A	4E-07		2E-04	Skin; Developmental; Cardiovascular; Neurological	3E+00	N/A	7E-03	3E+00
			Chemical Total	2E-04	--	4E-07		2E-04		1E+02	--	6E+01	2E+02
		Exposure Point Total						2E-04					2E+02
	Exposure Medium Total							2E-04					2E+02
Medium Total								2E-04					2E+02
Receptor Total							Receptor Risk Total	2E-04				Receptor HI Total	2E+02

Notes
N/A - Not Applicable

Kidney HI Across All Media =	1E+02
Developmental HI Across All Media =	6E+01
Neurological HI Across All Media =	3E+00
Eye HI Across All Media =	5E+01
Immunological HI Across All Media =	5E+01
Skin HI Across All Media =	3E+00
Cardiovascular HI Across All Media =	3E+00

TABLE 10.6.RME
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	cis-1,2-Dichloroethene						Kidney	5E+02	--	N/A	5E+02
			Tetrachloroethene	1E-04	7E-06	4E-05		2E-04					
			1,2,4-Trichlorobenzene						Kidney; Blood	4E-01	1E+01	3E-01	1E+01
			Trichloroethene	2E-04	5E-04	2E-05		7E-04					
			Vinyl chloride	4E-04	2E-05	N/A		5E-04					
			Dibenzo(a,h)anthracene	2E-05	N/A	3E-04		4E-04					
			Total PCB Aroclors						Eye; Developmental; Immunological	1E+01	N/A	2E+02	2E+02
			2,3,7,8-TCDD Toxic Equivalence	2E-05	N/A	3E-04		3E-04	Developmental	2E+00	N/A	2E+01	2E+01
			Arsenic	6E-04	N/A	2E-06		6E-04	Skin; Developmental; Cardiovascular; Neurological	2E+01	N/A	5E-02	2E+01
			Chemical Total	1E-03	5E-04	7E-04		3E-03		5E+02	1E+01	2E+02	7E+02
		Exposure Point Total						3E-03					7E+02
	Exposure Medium Total							3E-03					7E+02
Medium Total								3E-03					7E+02
Receptor Total							Receptor Risk Total	3E-03				Receptor HI Total	7E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	1E+01
Kidney HI Across All Media =	5E+02
Developmental HI Across All Media =	2E+02
Eye HI Across All Media =	2E+02
Immunological HI Across All Media =	2E+02
Skin HI Across All Media =	2E+01
Cardiovascular HI Across All Media =	2E+01

TABLE 10.6.CT
RISK SUMMARY
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Exposure Unit:	Groundwater, Entire Aquifer
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Entire Aquifer	Tap Water	cis-1,2-Dichloroethene						Kidney	2E+02	--	N/A	2E+02
			1,2,4-Trichlorobenzene						Kidney; Blood	2E-01	1E+00	9E-02	2E+00
			Trichloroethene	1E-04	5E-05	7E-06		2E-04					
			Vinyl chloride	2E-04	2E-06	N/A		2E-04					
			Dibenzo(a,h)anthracene	1E-05	N/A	2E-04		2E-04					
			Total PCB Aroclors						Eye; Developmental; Immunological	7E+00	N/A	1E+02	1E+02
			2,3,7,8-TCDD Toxic Equivalence	1E-05	N/A	2E-04		2E-04	Developmental	8E-01	N/A	1E+01	1E+01
			Arsenic	3E-04	N/A	6E-07		3E-04	Skin; Developmental; Cardiovascular; Neurological	8E+00	N/A	2E-02	8E+00
			Chemical Total	7E-04	5E-05	4E-04		1E-03		2E+02	1E+00	1E+02	4E+02
		Exposure Point Total						1E-03					4E+02
	Exposure Medium Total							1E-03					4E+02
Medium Total								1E-03					4E+02
Receptor Total							Receptor Risk Total	1E-03				Receptor HI Total	4E+02

Notes
N/A - Not Applicable

Blood HI Across All Media =	2E+00
Kidney HI Across All Media =	2E+02
Developmental HI Across All Media =	1E+02
Neurological HI Across All Media =	8E+00
Eye HI Across All Media =	1E+02
Immunological HI Across All Media =	1E+02
Skin HI Across All Media =	8E+00
Cardiovascular HI Across All Media =	8E+00

APPENDIX B

Historical Groundwater Data Summaries

Appendix B, Table B-1
Summary of Foster Wheeler Groundwater Samples
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Site, South Plainfield, NJ

Shallow Bedrock Groundwater Samples [1]		
Sample ID	Screened Interval (feet bgs)	Sample Date
MW01A	24-49	10/11/2000
MW02A	24-49	10/12/2000
MW03	17-32	10/12/2000
MW04	29-49	10/13/2000
MW05	25-45.5	10/17/2000
MW06	29-44	10/17/2000
MW07	43-58	10/11/2000
MW08	42-57.5	10/10/2000
MW09	29-54	10/18/2000
MW10	37-52	10/10/2000
MW11	34-59	10/18/2000
MW12	35-60	10/20/2000
FPW 3	"shallow"	10/13/2000
FPW 3	"deep"	10/20/2000

Test Pit Seep Water and Perched Water [2]		
Sample ID	Depth of Wet Zone [3] (feet bgs)	Sample Date
TP03	8-9.5	6/8/2000
TP06	3-6	6/12/2000
TP08	NA	6/9/2000
TP09	5-7	6/9/2000
TP09 DUP		6/9/2000
TP10	6-10	6/12/2000
MW02	7	8/3/2000
MW04	6-13	8/15/2000
MW06	4.5-10	8/8/2000
MW11	2-6	8/22/2000
MW12	4.5-8	9/5/2000

Notes

[1] Foster Wheeler (2001a) Data Evaluation Report, Appendix B Tables B-29 to B-34a.

[2] Foster Wheeler (2001a) Data Evaluation Report, Appendix B Tables B-23 to B-26 (test pit seeps) and Tables B-27 to B-28 (perched groundwater).

[3] Foster Wheeler (2002) Final Remedial Investigation Report, p. 3-7.

NA - Not Available

Appendix B, Table B-2
Foster Wheeler Shallow Bedrock Monitoring Well Data
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Site, South Plainfield, NJ

Chemical	Frequency of Detection	Range of Detected Concentrations (µg/L)	Screening Toxicity Value [1] (µg/L)	Basis	Chemical of Potential Concern? [Y/N]	Rationale for Selection or Exclusion [2]
Volatile Organic Compounds						
Acetone	1 / 2	4 J	2,200	nc	N	2
cis-1,2-Dichloroethene	12 / 14	2 - 175,000	7.3	nc	Y	1
Tetrachloroethene	3 / 14	12 J - 520	0.11	ca	Y	1
Toluene	1 / 14	1	230	nc	N	2
1,2,4-Trichlorobenzene	2 / 14	9 J - 1,200	0.41	nc	Y	1
Trichloroethene	12 / 14	12 - 110,000	2.0	ca	Y	1
Vinyl chloride	5 / 14	1 - 160	0.016	ca	Y	1
Semi-Volatile Organic Compounds						
bis(2-Ethylhexyl)phthalate	1 / 14	1 J	4.8	ca	N	2
Naphthalene	1 / 14	4.5 J	0.14	ca	Y	1
Pesticides						
Aldrin	10 / 13	0.022 - 1.3 D	0.004	ca	Y	1
beta-BHC	1 / 14	0.016 J	0.037	ca	N	2
delta-BHC	1 / 12	0.074 JN	NA	ca	Y	5
Heptachlor	1 / 13	0.13 JN	0.015	ca	Y	1
PCB Aroclors						
Aroclor 1232	9 / 14	0.53 - 80 D	0.0068	ca	Y	1
Aroclor 1254	3 / 14	4.1 - 8.5 J	0.034	ca	Y	1
PCB Congeners and Dioxins/Furans						
2,3,7,8-TCDD Toxic Equivalence (TEQ) [3]	5 / 5	2.4E-06 - 2.1E+00	5.2E-07	ca	Y	1
Inorganic Chemicals						
Aluminum	14 / 14	37.3 B - 747	3,700	nc	N	2
Antimony	1 / 14	3 B	1.5	nc	Y	1
Arsenic	2 / 14	3.4 B - 5.6 B	0.045	ca	Y	1
Barium	14 / 14	79.4 B - 1,590	730	nc	Y	1
Beryllium	10 / 14	0.21 B - 0.33 B	7.3	nc	N	2
Calcium	14 / 14	19,500 - 126,000	NA		N	3
Chromium	12 / 12	3.8 B - 18	0.043 [a]	ca	Y	1
Cobalt	7 / 14	0.66 B - 2.7 B	1.1	nc	Y	1
Copper	14 / 14	2.1 B - 36.9	150	nc	N	2
Cyanide	8 / 10	0.72 B - 5.6 B	73 [b]	nc	N	2
Iron	14 / 14	76.7 B - 1,210	2,600	nc	N	2
Magnesium	14 / 14	7,800 - 29,000	NA		N	3
Manganese	14 / 14	36.4 - 2,570	88	nc	Y	1
Nickel	14 / 14	3.2 B - 42 J	73 [d]	nc	N	2
Potassium	14 / 14	1,080 B - 7,490 J	NA		N	3
Selenium	1 / 14	4.5 BJ	18	nc	N	2
Sodium	14 / 14	13,100 J - 43,800 J	NA		N	3
Vanadium	13 / 14	1.3 B - 8.5 B	18	nc	N	2
Zinc	10 / 14	1.5 B - 44.6	1,100	nc	N	2

Notes

[1] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is for free cyanide (CN-).
c = Screening toxicity value is for mercuric chloride and other mercury salts.
d = Screening toxicity value is for nickel soluble salts.

[2] Rationale Codes:
1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5% (does not apply where sample size is less than 20)
5 = No screening toxicity value available

[3] 2,3,7,8-TCDD TEQ represents the sum of dioxin/furan TEQ and PCB congeners TEQ.

NA = Not Available

Appendix B, Table B-3
Foster Wheeler Test Pit Seep and Perched Groundwater Data
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Site, South Plainfield, NJ

Chemical	Frequency of Detection	Range of Detected Concentrations (μg/L)	Screening Toxicity Value [1] (μg/L)	Basis	Chemical of Potential Concern? [Y/N]	Rationale for Selection or Exclusion [2]
Volatile Organic Compounds						
Acetone	3 / 4	10 J - 14 J	2,200	nc	N	2
Benzene	2 / 10	0.4 J - 0.6 J	0.41	ca	Y	1
Chlorobenzene	4 / 10	3 - 255	9.1	nc	Y	1
1,2-Dichlorobenzene	3 / 10	10 - 42.5	37	nc	Y	1
1,3-Dichlorobenzene	3 / 10	16 - 34	NA		Y	5
1,4-Dichlorobenzene	3 / 10	29 J - 150	0.43	ca	Y	1
1,1-Dichloroethene	2 / 10	0.6 J - 4	34	nc	N	2
cis-1,2-Dichloroethene	8 / 10	3 - 3,900 D	7.3	nc	Y	1
trans-1,2-Dichloroethene	2 / 10	38 J - 140 J	11	nc	Y	1
Ethylbenzene	3 / 10	1 - 19	1.5	ca	Y	1
Methylene chloride	2 / 10	21 J - 140 J	4.8	ca	Y	1
1,1,2,2-Tetrachloroethane	1 / 10	0.4 J	0.067	ca	Y	1
Tetrachloroethene	3 / 10	0.7 J - 67.3	0.11	ca	Y	1
Toluene	2 / 10	0.7 J - 1	230	nc	N	2
1,2,4-Trichlorobenzene	4 / 10	36 - 450 J	0.41	nc	Y	1
1,1,2-Trichloroethane	1 / 10	2	0.24	ca	Y	1
Trichloroethene	8 / 10	8 - 15,000 D	2.0	ca	Y	1
Vinyl chloride	5 / 10	6 - 380	0.016	ca	Y	1
Xylene (total)	3 / 10	4 - 94	120	nc	N	2
Semi-Volatile Organic Compounds						
Acenaphthene	2 / 5	1 J - 4 J	220	nc	N	2
Acenaphthylene	1 / 5	5 J	NA		Y	5
Anthracene	1 / 5	11 J	1,100	nc	N	2
Benzo(a)anthracene	2 / 5	7 - 35 J	0.029	ca	Y	1
Benzo(a)pyrene	2 / 5	5 - 29 J	0.0029	ca	Y	1
Benzo(b)fluoranthene	2 / 5	1 J - 35 J	0.029	ca	Y	1
Benzo(g,h,i)perylene	2 / 5	4 J - 13 J	NA		Y	5
Benzo(k)fluoranthene	1 / 5	12 J	0.29	ca	Y	1
2-Chloronaphthalene	2 / 5	11 J	290	nc	N	2
2-Chlorophenol	1 / 5	3.5 J	18	nc	N	2
Chrysene	2 / 5	4 J - 9	2.9	ca	Y	1
o-Cresol	2 / 5	1 J - 3 J	180	nc	N	2
p-Cresol	2 / 5	4 J - 5.5	18	nc	N	2
Dibenzo(a,h)anthracene	1 / 5	4 J	0.0029	ca	Y	1
Dibenzofuran	1 / 5	5 J	3.7	nc	Y	1
2,4-Dichlorophenol	1 / 5	3.5 J	11	nc	N	2
2,4-Dimethylphenol	2 / 5	1 J - 5	73	nc	N	2
bis(2-Ethylhexyl)phthalate	1 / 4	2 J	4.8	ca	N	2
Fluoranthene	2 / 5	1 J - 18 J	150	nc	N	2
Fluorene	2 / 5	6 - 8 J	150	nc	N	2
Indeno(1,2,3-cd)pyrene	2 / 5	1 J - 16 J	0.029	ca	Y	1
2-Methylnaphthalene	1 / 5	2 J	15	nc	N	2
Naphthalene	3 / 5	2 J - 9 J	0.14	ca	Y	1
Phenanthrene	1 / 5	30 J	NA		Y	5
Phenol	1 / 5	14.5	1,100	nc	N	2
Pyrene	3 / 5	1 J - 20	110	nc	N	2
Pesticides						
Aldrin	4 / 4	5.3 J - 41.5 J	0.004	ca	Y	1
alpha-BHC	1 / 3	4.1 J	0.011	ca	Y	1
gamma-Chlordane	5 / 5	0.02 J - 32 J	0.19	ca	Y	1
Dieldrin	1 / 4	20 J	0.0042	ca	Y	1
4,4'-DDE	4 / 4	6.6 J - 25 J	0.20	ca	Y	1
4,4'-DDT	1 / 5	0.04 J	0.20	ca	N	2
Endrin	1 / 3	0.2 J	1.1	nc	Y	1
Endrin ketone	4 / 5	0.05 J - 5.4 J	NA		Y	5
Heptachlor	3 / 4	0.021 J - 14 J	0.015	ca	Y	1
Methoxychlor	2 / 3	1.9 J - 4.6 J	18	nc	N	2

Appendix B, Table B-3
Foster Wheeler Test Pit Seep and Perched Groundwater Data
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Site, South Plainfield, NJ

Chemical	**Frequency of Detection**	**Range of Detected Concentrations** (µg/L)	**Screening Toxicity Value [1]** (µg/L)	Basis	**Chemical of Potential Concern?** [Y/N]	**Rationale for Selection or Exclusion [2]**
PCB Aroclors						
Aroclor 1242	5 / 10	0.65 J - 1,450 D	0.034	ca	Y	1
Aroclor 1248	2 / 9	550 D - 2,300 D	0.034	ca	Y	1
Aroclor 1254	8 / 10	1.7 J - 5,100 D	0.034	ca	Y	1
PCB Congeners						
2,3,7,8-TCDD Toxic Equivalence (TEQ) [3]	2 / 2	7E-02 - 2E+00	5.2E-07	ca	Y	1
Inorganic Chemicals						
Aluminum	5 / 5	4,530 - 238,000	3,700	nc	Y	1
Antimony	2 / 5	2.7 B - 4.2 B	1.5	nc	Y	1
Arsenic	4 / 5	7.4 B - 334	0.045	ca	Y	1
Barium	5 / 5	158 B - 4,320	730	nc	Y	1
Beryllium	5 / 5	0.3 B - 15.2 J	7.3	nc	Y	1
Cadmium	4 / 5	0.78 - 1,890	1.8	nc	Y	1
Calcium	5 / 5	46,500 - 97,250	NA		N	3
Chromium	5 / 5	10.4 - 1,110	0.043 [a]	ca	Y	1
Cobalt	5 / 5	3.8 B - 161	1.1	nc	Y	1
Copper	5 / 5	26.4 J - 9,060 J	150	nc	Y	1
Cyanide	2 / 5	0.61 B - 2.6 B	73 [b]	nc	N	2
Iron	5 / 5	7420 - 301,000	2,600	nc	Y	1
Lead	5 / 5	52.4 - 11,900	15 [c]	al	Y	1
Magnesium	5 / 5	10,000 - 66,300	NA		N	3
Manganese	5 / 5	313 - 5,210	88	nc	Y	1
Mercury	4 / 5	0.08 B - 4	0.37 [d]	nc	Y	1
Nickel	5 / 5	14 B - 557	73 [e]	nc	Y	1
Potassium	5 / 5	4,210 B - 15,200	NA		N	3
Selenium	2 / 5	2.7 B - 8.8 J	18	nc	N	2
Silver	5 / 5	1.1 B - 22.6	18	nc	Y	1
Sodium	5 / 5	6,500 J - 14,600 J	NA		N	3
Vanadium	5 / 5	7.7 B - 1,330	18	nc	Y	1
Zinc	5 / 5	68.4 - 15,000	1,100	nc	Y	1

Notes

[1] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 201aa), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is for free cyanide (CN-).
c = Screening toxicity value is the drinking water action level (al) of 15 µg/L
d = Screening toxicity value is for methylmercury.
e = Screening toxicity value is for nickel soluble salts.

[2] Rationale Codes:

1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5% (does not apply where sample size is less than 20)
5 = No screening toxicity value available

[3] 2,3,7,8-TCDD TEQ represents PCB congeners TEQ.

NA = Not Available

Appendix B, Table B-4
USEPA 2008 Groundwater Data
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Site, South Plainfield, NJ

Chemical	USEPA 2008 Data Summary: Frequency of Detection	USEPA 2008 Data Summary: Range of Detected Concentrations (µg/L)	Screening Toxicity Value [1] (µg/L)	Basis	Chemical of Potential Concern? [Y/N]	Rationale for Selection or Exclusion [2]
Volatile Organic Compounds						
Acetone	2 / 50	1.3 J - 12 J	2,200	nc	N	2
Benzene	7 / 50	0.16 J - 15 J	0.41	ca	Y	1
Bromodichloromethane	1 / 50	0.645	0.12	ca	Y	1
2-Butanone	6 / 50	1.35 - 33	710	nc	N	2
Carbon tetrachloride	17 / 50	0.12 J - 270	0.44	ca	Y	1
Chlorobenzene	5 / 50	1 J - 110	9.1	nc	Y	1
Chloroethane	1 / 50	9.7 J	2,100	nc	N	2
Chloroform	8 / 50	0.53 - 3.85	0.19	ca	Y	1
Chloromethane	2 / 50	0.52 - 0.6	19	nc	N	2
Cyclohexane	5 / 50	3.7 J - 50 J	1,300	nc	N	2
Dibromochloromethane	1 / 50	0.1025 J	0.15	ca	N	2
1,2-Dichlorobenzene	7 / 50	0.091 - 62	37	nc	Y	1
1,3-Dichlorobenzene	5 / 50	1 - 81	NA		Y	5
1,4-Dichlorobenzene	9 / 50	0.1 - 115	0.43	ca	Y	1
1,1-Dichloroethane	2 / 50	0.16 - 0.17	2.4	ca	N	2
1,1-Dichloroethene	3 / 50	1.1 - 26	34	nc	N	2
cis-1,2-Dichloroethene	43 / 50	0.0635 J - 310,000	7.3	nc	Y	1
trans-1,2-Dichloroethene	18 / 50	0.11 J - 1,500	11	nc	Y	1
2-Hexanone	5 / 50	34 - 340	4.7	nc	Y	1
Isopropylbenzene	2 / 50	0.095 J - 3.55 J	68	nc	N	2
Methylcyclohexane	2 / 50	15 J - 15.5	NA		Y	5
Methyl tert-butyl ether	27 / 50	0.068 J - 520	12	ca	Y	1
Tetrachloroethene	30 / 50	0.079 J - 1,100	0.11	ca	Y	1
Toluene	4 / 50	0.99 - 7.15	230	nc	N	2
1,2,3-Trichlorobenzene	10 / 50	0.073 - 470	2.9	nc	Y	1
1,2,4-Trichlorobenzene	9 / 50	0.083 - 1,500	0.41	nc	Y	1
1,1,1-Trichloroethane	6 / 50	0.051 - 0.595	910	nc	N	2
1,1,2-Trichloroethane	8 / 50	0.42 - 130	0.24	ca	Y	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1 / 50	1.6	5,900	nc	N	2
Trichloroethene	47 / 50	0.28 J - 160,000	2.0	ca	Y	1
Vinyl chloride	14 / 50	0.05 J - 890	0.016	ca	Y	1
Semi-Volatile Organic Compounds						
Benzo(a)anthracene	1 / 50	2.76 J	0.029	ca	Y	1
Benzo(a)pyrene	1 / 50	0.96 J	0.0029	ca	Y	1
Benzo(b)fluoranthene	1 / 50	1.45 J	0.029	ca	Y	1
Benzo(k)fluoranthene	1 / 50	2.705 J	0.29	ca	Y	1
1,1'-Biphenyl	2 / 50	2.8 - 3.45	180	nc	N	2
Caprolactam	13 / 50	0.96 J - 48.5	1,800	nc	N	2
Carbazole	1 / 50	0.67 J	NA		Y	5
Chrysene	1 / 50	2.8 J	2.9	ca	N	2
cis-1,3-Dichloropropene	6 / 50	0.255 J - 64 J	0.43	ca	Y	1
trans-1,3-Dichloropropene	5 / 50	4.3 J - 48 J	0.43	ca	Y	1
bis(2-Ethylhexyl)phthalate	7 / 50	0.54 J - 2.6 J	4.8	ca	N	2
Fluoranthene	1 / 50	1.125 J	150	ca	N	2
4-Methyl-2-pentanone	5 / 50	2.9 - 26	2,000	nc	N	2
Naphthalene	1 / 50	7.3	0.14	ca	Y	1
Phenol	1 / 50	1.635 J	1,100	nc	N	2
Pyrene	2 / 50	0.51 J - 1.025 J	110	nc	N	2
Pesticides						
Aldrin	2 / 49	0.0066 J - 0.36	0.004		Y	1
beta-BHC	2 / 48	0.16 JN - 1.55 J	0.037	ca	Y	1
delta-BHC	5 / 49	0.0055 J - 0.091	NA		Y	5
gamma-BHC (Lindane)	3 / 50	0.0082 J - 0.49 JN	0.061		Y	1
alpha-Chlordane	1 / 49	0.074	NA		Y	5
gamma-Chlordane	6 / 49	0.0072 J - 5.2	0.19	ca	Y	1
4,4'-DDE	4 / 50	0.0071 - 4.1	0.20	ca	Y	1
4,4'-DDT	8 / 50	0.092 - 14	0.20	ca	Y	1
Dieldrin	7 / 50	0.016 J - 0.91 J	0.0042	ca	Y	1
Endosulfan I	1 / 49	0.0098 J	NA		Y	5
Endosulfan II	1 / 49	0.0277 J	NA		Y	5
Endosulfan sulfate	2 / 50	0.0057 J - 0.028 J	NA		Y	5
Endrin	1 / 49	0.64 J	1.1	nc	N	2
Endrin aldehyde	4 / 50	0.014 J - 0.066 J	NA		Y	5
Endrin ketone	3 / 50	0.0055 J - 0.032 J	NA		Y	5
Heptachlor	3 / 47	0.0084 J - 0.3	0.015	ca	Y	1
Heptachlor epoxide	8 / 49	0.0051 J - 6.4	0.0074	ca	Y	1

Appendix B, Table B-4
USEPA 2008 Groundwater Data
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Site, South Plainfield, NJ

Chemical	**USEPA 2008 Data Summary**		**Screening Toxicity Value [1]**		**Chemical of Potential Concern?**	**Rationale for Selection or Exclusion [2]**
	Frequency of Detection	**Range of Detected Concentrations** (µg/L)	(µg/L)	Basis	[Y/N]	
PCB Aroclors						
Aroclor-1242	6 / 50	1.1 JN - 165 J	0.034	ca	Y	1
Aroclor-1254	6 / 50	1.8 - 61 J	0.034	ca	Y	1
Inorganic Chemicals						
Arsenic	49 / 49	1.1 - 144.2	0.045	ca	Y	1
Barium	49 / 49	30.9 - 6,950	730	nc	Y	1
Cadmium	1 / 49	1.2 J	1.8	nc	N	2
Chromium	12 / 49	2.2 - 1,180	0.043 [a]	ca	Y	1
Cobalt	7 / 49	1.1 - 16.7 J	1.1	nc	Y	1
Copper	22 / 47	0.34 J - 63.4 J	150	nc	N	2
Lead	43 / 49	1.1 - 6.35	15 [b]	al	N	2
Manganese	42 / 49	0.8 - 1,300	88	nc	Y	1
Nickel	47 / 49	1.1 - 43.2	73 [c]	nc	N	2
Silver	7 / 49	0.06 J - 1.1	18	nc	N	2
Vanadium	37 / 49	4.15 - 41.2	18	nc	Y	1
Zinc	45 / 45	5.1 - 62.7	1,100	nc	N	2

Notes

[1] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is the drinking water action level (al) of 15 µg/L.
c = Screening toxicity value is for nickel soluble salts.

[2] Rationale Codes:

1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5% (does not apply where sample size is less than 20)
5 = No screening toxicity value available

NA = Not Available
ND = Not Detected

APPENDIX C

Evaluation of Groundwater Data from Onsite Monitoring Wells Only

APPENDIX C

Onsite Groundwater Data Summary

Groundwater data from only the onsite monitoring wells, across all depths, was not quantitatively evaluated as a separate “entire aquifer” exposure unit in this BHHRA. While chemicals were detected at relatively greater concentrations in the onsite vs. offsite monitoring wells, and there is the potential for future potable use of groundwater within the former CDE facility boundaries (however unlikely), it was assumed detected concentrations are elevated enough that the potential for human health risks is evident without quantifying exposure and risk. To illustrate, the groundwater data from all onsite wells, across all depths, were summarized and presented herein.

APPENDIX C, TABLE C-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - ENTIRE AQUIFER, ONSITE MONITORING WELLS ONLY
CORNELL DUBILIER ELECTRONICS INC. SITE
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Detection Frequency	Concentration Used for Screening	Screening Toxicity Value [1]	Basis	Potential ARAR/TBC Value [2]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
Within the Boundaries of the Former CDE Facility	67-64-1	Acetone	0.82 J	78	µg/L	22 / 91	78	2,200	nc	NA	--	N	2
	71-43-2	Benzene	0.16 J	24	µg/L	22 / 93	24	0.41	ca	1	NJDEP MCL	Y	1
	75-27-4	Bromodichloromethane	0.28 J	0.55	µg/L	4 / 92	0.55	0.12	ca	80	Federal MCL	N	1,4
	75-25-2	Bromoform	0.58	2.9	µg/L	5 / 92	2.9	8.5	ca	80	Federal MCL	N	2
	78-93-3	2-Butanone	5.5	39	µg/L	3 / 89	39	710	nc	NA	--	N	2,4
	56-23-5	Carbon tetrachloride	0.25 J	0.72 J	µg/L	2 / 93	0.72	0.44	ca	2	NJDEP MCL	N	1,4
	108-90-7	Chlorobenzene	0.21 J	65 E	µg/L	31 / 93	65	9.1	nc	50	NJDEP MCL	Y	1
	67-66-3	Chloroform	0.33 J	150 J	µg/L	27 / 93	150	0.19	ca	80	Federal MCL	Y	1
	74-87-3	Chloromethane	0.62 J	1.3	µg/L	2 / 93	1.3	19	nc	NA	--	N	2,4
	110-82-7	Cyclohexane	0.23 J	13	µg/L	11 / 93	13	1,300	nc	NA	--	N	2
	96-12-8	1,2-Dibromo-3-chloropropane	0.039 J	0.39 J	µg/L	7 / 93	0.39	0.00032	ca	0.2	Federal MCL	Y	1
	124-48-1	Dibromochloromethane	0.28 J	1.2	µg/L	4 / 93	1.2	0.15	ca	80	Federal MCL	N	1,4
	106-93-4	1,2-Dibromoethane	0.01 J	0.01 J	µg/L	1 / 93	0.01	0.0065	ca	0.05	Federal MCL	N	1,4
	95-50-1	1,2-Dichlorobenzene	0.15 J	56	µg/L	25 / 92	56	37	nc	600	Federal MCL	Y	1
	541-73-1	1,3-Dichlorobenzene	0.17 J	120	µg/L	31 / 92	120	NA		600	NJDEP MCL	Y	5
	106-46-7	1,4-Dichlorobenzene	0.25 J	110	µg/L	32 / 92	110	0.43	ca	75	Federal MCL	Y	1
	75-34-3	1,1-Dichloroethane	0.11 J	26 E	µg/L	31 / 93	26	2.4	ca	50	NJDEP MCL	Y	1
	107-06-2	1,2-Dichloroethane	0.22 J	15	µg/L	12 / 93	15	0.15	ca	2	NJDEP MCL	Y	1
	75-35-4	1,1-Dichloroethene	0.73	280 J	µg/L	40 / 93	280	34	nc	2	NJDEP MCL	Y	1
	156-59-2	cis-1,2-Dichloroethene	0.25 J	390,000 J	µg/L	89 / 93	390,000	7.3	nc	70	Federal MCL	Y	1
	156-60-5	trans-1,2-Dichloroethene	0.11 J	1300 J	µg/L	55 / 93	1,300	11	nc	100	Federal MCL	Y	1
	100-41-4	Ethylbenzene	0.43 J	20	µg/L	5 / 93	20	1.5	ca	700	Federal MCL	Y	1
	98-82-8	Isopropylbenzene	0.2 J	5.1 J	µg/L	3 / 93	5.1	68	nc	NA	--	N	2,4
	79-20-9	Methyl acetate	3.4 J	3.4 J	µg/L	1 / 93	3.4	3,700	nc	NA	--	N	2,4
	1634-04-4	Methyl tert-butyl ether	0.15 J	74 E	µg/L	44 / 93	74	12	ca	70	NJDEP MCL	Y	1
	108-87-2	Methylcyclohexane	0.14 J	42	µg/L	11 / 92	42	NA		NA	--	Y	5
	75-09-2	Methylene chloride	0.36 J	7 J	µg/L	10 / 93	7.0	4.8	ca	3	NJDEP MCL	Y	1
	127-18-4	Tetrachloroethene	0.16 J	1,600 E	µg/L	52 / 93	1,600	0.11	ca	1	NJDEP MCL	Y	1
	108-88-3	Toluene	0.13 J	78 J	µg/L	52 / 93	78	230	nc	1,000	Federal MCL	N	2
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.2	2.2	µg/L	3 / 93	2.2	5,900	nc	NA	--	N	2,4
	87-61-6	1,2,3-Trichlorobenzene	0.12 J	280	µg/L	35 / 92	280	2.9	nc	NA	--	Y	1
	120-82-1	1,2,4-Trichlorobenzene	0.1 J	1,600 J	µg/L	44 / 92	1,600	0.41	nc	9	NJDEP MCL	Y	1
	71-55-6	1,1,1-Trichloroethane	0.32 J	0.73 J	µg/L	3 / 93	0.7	910	nc	30	NJDEP MCL	N	2,4
	79-00-5	1,1,2-Trichloroethane	0.46 J	120	µg/L	19 / 93	120	0.24	ca	3	NJDEP MCL	Y	1
	79-01-6	Trichloroethene	0.52 J	170,000 E	µg/L	89 / 93	170,000	2.0	ca	1	NJDEP MCL	Y	1
	1330-20-7	m,p-Xylene	0.41 J	15	µg/L	5 / 93	15	20	nc	1,000	NJDEP MCL	N	2
	1330-20-7	o-Xylene	0.33 J	85	µg/L	8 / 93	85	20	nc	1,000	NJDEP MCL	Y	1
	75-01-4	Vinyl chloride	0.5 J	860 J	µg/L	51 / 93	860	0.016	ca	2	Federal MCL	Y	1

APPENDIX C, TABLE C-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - ENTIRE AQUIFER, ONSITE MONITORING WELLS ONLY
CORNELL DUBILIER ELECTRONICS INC. SITE
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Detection Frequency	Concentration Used for Screening	Screening Toxicity Value [1]	Basis	Potential ARAR/TBC Value [2]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
	83-32-9	Acenaphthene	0.26	0.39	µg/L	4 / 94	0.39	220	nc	NA	--	N	2,4
	98-86-2	Acetophenone	1.6 J	2.8 J	µg/L	2 / 94	2.8	370	nc	NA	--	N	2,4
	120-12-7	Anthracene	0.49 J	0.49 J	µg/L	1 / 94	0.49	1,100	nc	NA	--	N	2,4
	100-52-7	Benzaldehyde	4.2 J	7.2	µg/L	2 / 93	7.2	370	nc	NA	--	N	2,4
	56-55-3	Benzo(a)anthracene	0.18	1.7 E	µg/L	2 / 94	1.7	0.029	ca	NA	--	N	1,4
	50-32-8	Benzo(a)pyrene	0.14	4.3 J	µg/L	5 / 94	4.3	0.0029	ca	0.2	Federal MCL	Y	1
	205-99-2	Benzo(b)fluoranthene	0.096 J	3 J	µg/L	5 / 94	3	0.029	ca	NA	--	Y	1
	191-24-2	Benzo(g,h,i)perylene	0.17	2.6 J	µg/L	6 / 94	2.6	NA		NA	--	Y	5
	207-08-9	Benzo(k)fluoranthene	0.091 J	3.5 J	µg/L	5 / 94	3.5	0.29	ca	NA	--	Y	1
	92-52-4	1,1'-Biphenyl	1.1 J	17	µg/L	4 / 94	17	0.083	nc	NA	--	N	1,4
	117-81-7	bis(2-Ethylhexyl)phthalate	2.1 J	12	µg/L	13 / 94	12	4.8	ca	6	Federal MCL	Y	1
	105-60-2	Caprolactam	2.3 J	84 E	µg/L	15 / 94	84	1,800	nc	NA	--	N	2
	86-74-8	Carbazole	0.54 J	0.54 J	µg/L	1 / 94	0.54	NA		NA	--	N	4,5
	95-57-8	2-Chlorophenol	2.6 J	2.6 J	µg/L	1 / 93	2.6	18	nc	NA	--	N	2,4
	218-01-9	Chrysene	0.11	1.7 E	µg/L	3 / 94	1.7	2.9	ca	NA	--	N	2,4
	53-70-3	Dibenzo(a,h)anthracene	0.096 J	5.5 E	µg/L	14 / 94	5.5	0.0029	ca	NA	--	Y	1
	120-83-2	2,4-Dichlorophenol	5.3	5.3	µg/L	1 / 94	5.3	11	nc	NA	--	N	2,4
	84-66-2	Diethylphthalate	1.7 J	41	µg/L	2 / 94	41	2,900	nc	NA	--	N	2,4
	131-11-3	Dimethylphthalate	11	11	µg/L	1 / 94	11	NA		NA	--	N	4,5
	206-44-0	Fluoranthene	0.38	2.9 E	µg/L	2 / 94	2.9	150	nc	NA	--	N	2,4
	86-73-7	Fluorene	0.29	0.56	µg/L	2 / 94	0.56	150	nc	NA	--	N	2,4
	193-39-5	Indeno(1,2,3-cd)pyrene	0.08	3.1 J	µg/L	30 / 94	3.1	0.029	ca	NA	--	Y	1
	91-57-6	2-Methylnaphthalene	0.12	2.2 E	µg/L	6 / 94	2.2	15	nc	NA	--	N	2
	91-20-3	Naphthalene	0.08 J	14 J	µg/L	46 / 94	14	0.14	ca	300	NJDEP MCL	Y	1
	87-86-5	Pentachlorophenol	0.076 J	0.076 J	µg/L	1 / 62	0.08	0.17	ca	1	Federal MCL	N	2,4
	85-01-8	Phenanthrene	0.13	1.5 E	µg/L	2 / 94	1.5	NA		NA	--	N	4,5
	108-95-2	Phenol	1.8 J	4.3 J	µg/L	3 / 93	4.3	1,100	nc	NA	--	N	2,4
	129-00-0	Pyrene	0.33	2.3 E	µg/L	3 / 94	2.3	110	nc	NA	--	N	2,4
	95-94-3	1,2,4,5-Tetrachlorobenzene	3.5 J	3.5 J	µg/L	1 / 94	3.5	1.1	nc	NA	--	N	1,4
	12674-11-2	Aroclor 1016	0.064 J	30 E	µg/L	15 / 94	30	0.26	nc	0.5	Federal MCL	Y	1
	12672-29-6	Aroclor 1248	0.12 J	7,300 J	µg/L	14 / 88	7,300	0.034	ca	0.5	Federal MCL	Y	1
	11097-69-1	Aroclor 1254	0.043 J	5,600 J	µg/L	46 / 94	5,600	0.034	ca	0.5	Federal MCL	Y	1
	319-84-6	alpha-BHC	0.09 JN	68	µg/L	13 / 94	68	0.011	ca	NA	--	Y	1
	319-85-7	beta-BHC	0.18 J	680 EP	µg/L	4 / 94	680	0.037	ca	NA	--	N	1,4
	319-86-8	delta-BHC	0.34 J	880 J	µg/L	3 / 71	880	NA		NA	--	N	4,5
	72-54-8	4,4'-DDD	0.09 J	1,800 NJ	µg/L	9 / 81	1,800	0.28	ca	NA	--	Y	1
	72-55-9	4,4'-DDE	0.09 J	1,600 J	µg/L	14 / 91	1,600	0.20	ca	NA	--	Y	1
	50-29-3	4,4'-DDT	0.13	4,000 J	µg/L	18 / 90	4,000	0.20	ca	NA	--	Y	1
	60-57-1	Dieldrin	0.18 JN	350 JN	µg/L	6 / 90	350	0.0042	ca	NA	--	Y	1
	33213-65-9	Endosulfan II	0.17 J	240 J	µg/L	7 / 94	240	NA		NA	--	Y	5
	1031-07-8	Endosulfan sulfate	0.078 J	75 JN	µg/L	7 / 94	75	NA		NA	--	Y	5
	72-20-8	Endrin	0.19 JN	0.19 JN	µg/L	1 / 90	0.19	1.1	nc	2	Federal MCL	N	2,4
	7421-93-4	Endrin aldehyde	0.11 J	150 J	µg/L	6 / 94	150	NA		NA	--	Y	5
	76-44-8	Heptachlor	0.06 J	300	µg/L	14 / 94	300	0.015	ca	0.4	Federal MCL	Y	1
	1024-57-3	Heptachlor epoxide	2.6 NJ	2.6 NJ	µg/L	1 / 94	2.6	0.0074	ca	0.2	Federal MCL	N	1,4
	72-43-5	Methoxychlor	0.97 JN	400 JN	µg/L	4 / 94	400	18	nc	40	Federal MCL	N	1,4
	--	2,3,7,8-TCDD Toxic Equivalence (TEQ) [3]	8.1E-10 J	2.2E-01	µg/L	24 / 25	2.2E-01	5.2E-07	ca	3E-05	Federal MCL	Y	1

APPENDIX C, TABLE C-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER - ENTIRE AQUIFER, ONSITE MONITORING WELLS ONLY
CORNELL DUBILIER ELECTRONICS INC. SITE
SOUTH PLAINFIELD, NEW JERSEY

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Entire Aquifer

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Detection Frequency	Concentration Used for Screening	Screening Toxicity Value [1]	Basis	Potential ARAR/TBC Value [2]	Potential ARAR/TBC Source	COPC Flag [Y/N]	Rationale for Selection or Deletion
	7429-90-5	Aluminum	26.6 J	6,210	µg/L	36 / 93	6,210	3,700	nc	NA	--	Y	1
	7440-36-0	Antimony	2.0	3.5	µg/L	3 / 94	3.5	1.5	nc	6	Federal MCL	N	1,4
	7440-38-2	Arsenic	0.68 J	829	µg/L	94 / 94	829	0.045	ca	5	NJDEP MCL	Y	1
	7440-39-3	Barium	52	2,650	µg/L	94 / 94	2,650	730	nc	2,000	Federal MCL	Y	1
	7440-41-7	Beryllium	0.2 J	0.23 J	µg/L	2 / 94	0.23	7.3	nc	4	Federal MCL	N	2,4
	7440-43-9	Cadmium	0.037 J	17	µg/L	10 / 94	17	1.8	nc	5	Federal MCL	Y	1
	7440-70-2	Calcium	40,100	142,000	µg/L	94 / 94	142,000	NA		NA	--	N	3,5
	18540-29-9	Chromium	0.11 J	97	µg/L	41 / 94	97	0.043 [a]	ca	100	Federal MCL	Y	1
	7440-48-4	Cobalt	0.075 J	3.5	µg/L	32 / 94	3.5	1.1	nc	NA	--	Y	1
	7440-50-8	Copper	0.53 J	80	µg/L	75 / 94	80	150	nc	1,300	Federal MCL	N	2
	57-12-5	Cyanide	1.1 J	11.6 J	µg/L	7 / 94	12	73 [b]	nc	200	Federal MCL	N	2
	7439-89-6	Iron	46.6 J	8,520	µg/L	44 / 94	8,520	2,600	nc	NA	--	Y	1
	7739-92-1	Lead	0.25 J	33	µg/L	81 / 94	33	15 [c]	al	15	Federal MCL	Y	1
	7439-95-4	Magnesium	6,960	30,300	µg/L	94 / 94	30,300	NA		NA	--	N	3,5
	7439-96-5	Manganese	3.9	1,660	µg/L	94 / 94	1,660	88	nc	NA	--	Y	1
	7487-94-7	Mercury	0.048 J	0.11 J	µg/L	5 / 47	0.11	0.37 [d]	nc	2	Federal MCL	N	2
	7440-02-0	Nickel	0.25 J	18	µg/L	74 / 78	18	73 [e]	nc	NA	--	N	2
	7440-9-7	Potassium	1,390 J	9,450	µg/L	53 / 94	9,450	NA		NA	--	N	3,5
	7782-49-2	Selenium	0.16 J	0.37 J	µg/L	17 / 94	0.37	18	nc	50	Federal MCL	N	2
	7440-22-4	Silver	0.016 J	0.12 J	µg/L	8 / 94	0.12	18	nc	NA	--	N	2
	7440-23-5	Sodium	10,900	59,800	µg/L	94 / 94	59,800	NA		50,000	NJDEP MCL	N	3,5
	7440-62-2	Vanadium	1.3 J	30	µg/L	66 / 94	30	18	nc	NA	--	Y	1
	7440-66-6	Zinc	2.5	187	µg/L	94 / 94	187	1,100	nc	NA	--	N	2

Notes

[1] The relevant screening toxicity values are the USEPA Regional Screening Levels (RSL) for tapwater from May 2011 (USEPA, 2011a), which are based on either a cancer (ca) risk of one in a million (i.e., 10^{-6} cancer risk level) or a non-cancer (nc) hazard quotient (HQ) of 1. Consistent with USEPA, Region 2 guidance, RSLs based on non-cancer effects were reduced by a factor of 10 to represent a target HQ of 0.1. Where a cancer risk-based RSL was greater than the resultant non-cancer 0.1 HQ-based RSL, the applicable screening toxicity value is the non-cancer based level.

a = Screening toxicity value is for Chromium VI.
b = Screening toxicity value is for free cyanide (CN-).
c = Screening toxicity value is the drinking water action level (al) of 15 µg/L.
d = Screening toxicity value is for methylmercury.
e = Screening toxicity value is for nickel soluble salts.

[2] The potential ARAR/TBC value is the lower of the Safe Drinking Water Act Maximum Contaminant Levels (MCL) (40 CFR 141) and the New Jersey Drinking Water Quality Act MCL (NJAC 7:10-16).

[3] 2,3,7,8-TCDD Toxic Equivalence (TEQ) represents the sum of dioxin/furan TEQ and PCB congeners TEQ.

NA = Not Available

Rationale Codes:
1 = Maximum concentration exceeds screening toxicity value
2 = Maximum concentration does not exceed screening toxicity value
3 = Chemical is an essential nutrient
4 = Frequency of detection is less than 5%
5 = No screening toxicity value available

APPENDIX D

ProUCL version 4.1.00 Output Files for Groundwater COPCs
D1 - 95% UCL Calculations
D2 - Box Plots

Benzene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	31
Number of Distinct Detected Data	27	Number of Non-Detect Data	230
		Percent Non-Detects	88.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.135	Minimum Detected	-2.002
Maximum Detected	24	Maximum Detected	3.178
Mean of Detected	1.791	Mean of Detected	-0.578
SD of Detected	4.893	SD of Detected	1.152
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.35	Shapiro Wilk Test Statistic	0.806
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.316	Mean	-0.74
SD	28.96	SD	1.408
95% DL/2 (t) UCL	8.275	95% H-Stat (DL/2) UCL	1.599
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.209
		SD in Log Scale	0.75
		Mean in Original Scale	0.504
		SD in Original Scale	1.738
		95% t UCL	0.681
		95% Percentile Bootstrap UCL	0.689
		95% BCA Bootstrap UCL	0.837
		95% H-UCL	0.433
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.51	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.511		
nu star	31.62		
A-D Test Statistic	4.953	Nonparametric Statistics	
5% A-D Critical Value	0.806	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.806	Mean	0.486
5% K-S Critical Value	0.166	SD	1.77
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.116
		95% KM (t) UCL	0.677
Assuming Gamma Distribution		95% KM (z) UCL	0.676
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.674
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.294
Maximum	24	95% KM (BCA) UCL	0.722
Mean	0.868	95% KM (Percentile Bootstrap) UCL	0.682
Median	0.319	95% KM (Chebyshev) UCL	0.991
SD	1.906	97.5% KM (Chebyshev) UCL	1.209
k star	0.147	99% KM (Chebyshev) UCL	1.638
Theta star	5.893		
Nu star	76.88	Potential UCLs to Use	
AppChi2	57.68	95% KM (BCA) UCL	0.722
95% Gamma Approximate UCL	1.157		
95% Adjusted Gamma UCL	1.159		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Bromodichloromethane

General Statistics - Data are in µg/L.			
Number of Valid Data	260	Number of Detected Data	23
Number of Distinct Detected Data	20	Number of Non-Detect Data	237
		Percent Non-Detects	91.15%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	1.7	Maximum Detected	0.531
Mean of Detected	0.539	Mean of Detected	-0.808
SD of Detected	0.389	SD of Detected	0.607
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	260
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.766	Shapiro Wilk Test Statistic	0.961
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.226	Mean	-0.758
SD	28.98	SD	1.388
95% DL/2 (t) UCL	8.193	95% H-Stat (DL/2) UCL	1.52
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.122
		SD in Log Scale	0.419
		Mean in Original Scale	0.357
		SD in Original Scale	0.175
		95% t UCL	0.375
		95% Percentile Bootstrap UCL	0.375
		95% BCA Bootstrap UCL	0.377
		95% H-UCL	0.372
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.46	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.219		
nu star	113.1		
A-D Test Statistic	0.73	Nonparametric Statistics	
5% A-D Critical Value	0.751	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.751	Mean	0.36
5% K-S Critical Value	0.183	SD	0.17
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0279
		95% KM (t) UCL	0.406
Assuming Gamma Distribution		95% KM (z) UCL	0.406
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.408
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.41
Maximum	1.7	95% KM (BCA) UCL	0.404
Mean	0.434	95% KM (Percentile Bootstrap) UCL	0.404
Median	0.466	95% KM (Chebyshev) UCL	0.481
SD	0.245	97.5% KM (Chebyshev) UCL	0.534
k star	0.668	99% KM (Chebyshev) UCL	0.637
Theta star	0.649		
Nu star	347.4	Potential UCLs to Use	
AppChi2	305.2	95% KM (t) UCL	0.406
95% Gamma Approximate UCL	0.494		
95% Adjusted Gamma UCL	0.494		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chlorobenzene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	31
Number of Distinct Detected Data	28	Number of Non-Detect Data	230
		Percent Non-Detects	88.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.21	Minimum Detected	-1.561
Maximum Detected	65	Maximum Detected	4.174
Mean of Detected	10.97	Mean of Detected	0.762
SD of Detected	18.36	SD of Detected	1.947
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.638	Shapiro Wilk Test Statistic	0.847
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.316	Mean	-0.63
SD	29.6	SD	1.558
95% DL/2 (t) UCL	9.341	95% H-Stat (DL/2) UCL	2.315
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.796
		SD in Log Scale	1.4
		Mean in Original Scale	1.87
		SD in Original Scale	7.107
		95% t UCL	2.596
		95% Percentile Bootstrap UCL	2.684
		95% BCA Bootstrap UCL	2.884
		95% H-UCL	1.491
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.385	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.48		
nu star	23.88		
A-D Test Statistic	2.342	Nonparametric Statistics	
5% A-D Critical Value	0.831	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.831	Mean	1.68
5% K-S Critical Value	0.169	SD	7.205
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.46
		95% KM (t) UCL	2.44
Assuming Gamma Distribution		95% KM (z) UCL	2.437
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.429
Minimum	1.00E-06	95% KM (bootstrap t) UCL	2.776
Maximum	65	95% KM (BCA) UCL	2.463
Mean	3.533	95% KM (Percentile Bootstrap) UCL	2.419
Median	1.00E-06	95% KM (Chebyshev) UCL	3.687
SD	7.833	97.5% KM (Chebyshev) UCL	4.555
k star	0.103	99% KM (Chebyshev) UCL	6.261
Theta star	34.27		
Nu star	53.81	Potential UCLs to Use	
AppChi2	37.96	95% KM (Chebyshev) UCL	3.687
95% Gamma Approximate UCL	5.009		
95% Adjusted Gamma UCL	5.019		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroform

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	97
Number of Distinct Detected Data	62	Number of Non-Detect Data	164
		Percent Non-Detects	62.84%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.24	Minimum Detected	-1.427
Maximum Detected	150	Maximum Detected	5.011
Mean of Detected	3.25	Mean of Detected	0.123
SD of Detected	15.26	SD of Detected	1.009
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.422	Lilliefors Test Statistic	0.107
5% Lilliefors Critical Value	0.09	5% Lilliefors Critical Value	0.09
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.035	Mean	-0.328
SD	30.12	SD	1.453
95% DL/2 (t) UCL	9.113	95% H-Stat (DL/2) UCL	2.602
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.646
		SD in Log Scale	1.025
		Mean in Original Scale	1.47
		SD in Original Scale	9.377
		95% t UCL	2.428
		95% Percentile Bootstrap UCL	2.596
		95% BCA Bootstrap UCL	3.682
		95% H-UCL	1.016
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.576	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.641		
nu star	111.8		
A-D Test Statistic	11.2	Nonparametric Statistics	
5% A-D Critical Value	0.81	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.81	Mean	1.522
5% K-S Critical Value	0.0955	SD	9.452
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.594
		95% KM (t) UCL	2.503
Assuming Gamma Distribution		95% KM (z) UCL	2.499
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.5
Minimum	1.00E-06	95% KM (bootstrap t) UCL	6.553
Maximum	150	95% KM (BCA) UCL	2.777
Mean	1.422	95% KM (Percentile Bootstrap) UCL	2.681
Median	0.0979	95% KM (Chebyshev) UCL	4.112
SD	9.408	97.5% KM (Chebyshev) UCL	5.234
k star	0.114	99% KM (Chebyshev) UCL	7.436
Theta star	12.47		
Nu star	59.51	Potential UCLs to Use	
AppChi2	42.77	95% KM (BCA) UCL	2.777
95% Gamma Approximate UCL	1.979		
95% Adjusted Gamma UCL	1.982		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Dibromochloromethane

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	18
Number of Distinct Detected Data	15	Number of Non-Detect Data	243
		Percent Non-Detects	93.10%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.21	Minimum Detected	-1.561
Maximum Detected	1.2	Maximum Detected	0.182
Mean of Detected	0.407	Mean of Detected	-1.003
SD of Detected	0.231	SD of Detected	0.434
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.716	Shapiro Wilk Test Statistic	0.908
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.192	Mean	-0.785
SD	28.93	SD	1.383
95% DL/2 (t) UCL	8.148	95% H-Stat (DL/2) UCL	1.467
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.197
		SD in Log Scale	0.293
		Mean in Original Scale	0.316
		SD in Original Scale	0.103
		95% t UCL	0.326
		95% Percentile Bootstrap UCL	0.326
		95% BCA Bootstrap UCL	0.328
		95% H-UCL	0.325
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.193	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.097		
nu star	150.9		
A-D Test Statistic	0.761	Nonparametric Statistics	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.743	Mean	0.312
5% K-S Critical Value	0.204	SD	0.0943
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	0.0187
		95% KM (t) UCL	0.343
Assuming Gamma Distribution		95% KM (z) UCL	0.343
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.344
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.351
Maximum	1.2	95% KM (BCA) UCL	0.344
Mean	0.355	95% KM (Percentile Bootstrap) UCL	0.343
Median	0.385	95% KM (Chebyshev) UCL	0.393
SD	0.15	97.5% KM (Chebyshev) UCL	0.429
k star	1.313	99% KM (Chebyshev) UCL	0.498
Theta star	0.271		
Nu star	685.5	Potential UCLs to Use	
AppChi2	625.8	95% KM (t) UCL	0.343
95% Gamma Approximate UCL	0.389		
95% Adjusted Gamma UCL	0.389		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichlorobenzene

General Statistics - Data are in µg/L.			
Number of Valid Data	258	Number of Detected Data	25
Number of Distinct Detected Data	23	Number of Non-Detect Data	233
		Percent Non-Detects	90.31%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.15	Minimum Detected	-1.897
Maximum Detected	56	Maximum Detected	4.025
Mean of Detected	6.82	Mean of Detected	0.51
SD of Detected	12.63	SD of Detected	1.741
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	258
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.588	Shapiro Wilk Test Statistic	0.937
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.778	Mean	-0.671
SD	29.32	SD	1.494
95% DL/2 (t) UCL	8.791	95% H-Stat (DL/2) UCL	1.985
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.574
		SD in Log Scale	1.456
		Mean in Original Scale	0.94
		SD in Original Scale	4.326
		95% t UCL	1.384
		95% Percentile Bootstrap UCL	1.418
		95% BCA Bootstrap UCL	1.579
		95% H-UCL	0.753
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.429	Data appear Lognormal at 5% Significance Level	
Theta Star	15.91		
nu star	21.44		
A-D Test Statistic	1.352	Nonparametric Statistics	
5% A-D Critical Value	0.817	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.817	Mean	0.906
5% K-S Critical Value	0.186	SD	4.387
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.285
		95% KM (t) UCL	1.376
Assuming Gamma Distribution		95% KM (z) UCL	1.374
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.368
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.903
Maximum	56	95% KM (BCA) UCL	1.479
Mean	1.733	95% KM (Percentile Bootstrap) UCL	1.427
Median	1.00E-06	95% KM (Chebyshev) UCL	2.146
SD	4.65	97.5% KM (Chebyshev) UCL	2.683
k star	0.0994	99% KM (Chebyshev) UCL	3.737
Theta star	17.44		
Nu star	51.27	Potential UCLs to Use	
AppChi2	35.82	95% KM (Chebyshev) UCL	2.146
95% Gamma Approximate UCL	2.48		
95% Adjusted Gamma UCL	2.485		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,3-Dichlorobenzene

General Statistics - Data are in µg/L.			
Number of Valid Data	258	Number of Detected Data	32
Number of Distinct Detected Data	30	Number of Non-Detect Data	226
		Percent Non-Detects	87.60%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.015	Minimum Detected	-4.2
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	10.81	Mean of Detected	0.544
SD of Detected	23.67	SD of Detected	2.105
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	258
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.51	Shapiro Wilk Test Statistic	0.959
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.312	Mean	-0.657
SD	30.21	SD	1.556
95% DL/2 (t) UCL	9.418	95% H-Stat (DL/2) UCL	2.245
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.33
		SD in Log Scale	1.648
		Mean in Original Scale	1.723
		SD in Original Scale	8.921
		95% t UCL	2.64
		95% Percentile Bootstrap UCL	2.706
		95% BCA Bootstrap UCL	3.203
		95% H-UCL	1.362
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.351	Data appear Lognormal at 5% Significance Level	
Theta Star	30.82		
nu star	22.44		
A-D Test Statistic	1.468	Nonparametric Statistics	
5% A-D Critical Value	0.841	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.841	Mean	1.613
5% K-S Critical Value	0.167	SD	9.015
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.578
		95% KM (t) UCL	2.566
Assuming Gamma Distribution		95% KM (z) UCL	2.563
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.554
Minimum	1.00E-06	95% KM (bootstrap t) UCL	3.773
Maximum	120	95% KM (BCA) UCL	2.703
Mean	3.205	95% KM (Percentile Bootstrap) UCL	2.611
Median	1.00E-06	95% KM (Chebyshev) UCL	4.131
SD	9.407	97.5% KM (Chebyshev) UCL	5.22
k star	0.0977	99% KM (Chebyshev) UCL	7.361
Theta star	32.81		
Nu star	50.4	Potential UCLs to Use	
AppChi2	35.1	97.5% KM (Chebyshev) UCL	5.22
95% Gamma Approximate UCL	4.602		
95% Adjusted Gamma UCL	4.611		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,4-Dichlorobenzene

General Statistics - Data are in µg/L.			
Number of Valid Data	258	Number of Detected Data	34
Number of Distinct Detected Data	28	Number of Non-Detect Data	224
		Percent Non-Detects	86.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	110	Maximum Detected	4.7
Mean of Detected	14.46	Mean of Detected	1.132
SD of Detected	23.39	SD of Detected	1.914
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	258
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.659	Shapiro Wilk Test Statistic	0.875
5% Shapiro Wilk Critical Value	0.933	5% Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.876	Mean	-0.565
SD	30.35	SD	1.609
95% DL/2 (t) UCL	9.995	95% H-Stat (DL/2) UCL	2.716
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.317
		SD in Log Scale	1.768
		Mean in Original Scale	2.253
		SD in Original Scale	9.651
		95% t UCL	3.245
		95% Percentile Bootstrap UCL	3.304
		95% BCA Bootstrap UCL	3.751
		95% H-UCL	1.752
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.406	Data do not follow a Discernable Distribution (0.05)	
Theta Star	35.64		
nu star	27.6		
A-D Test Statistic	2.347	Nonparametric Statistics	
5% A-D Critical Value	0.829	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.829	Mean	2.279
5% K-S Critical Value	0.161	SD	9.754
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.625
		95% KM (t) UCL	3.312
Assuming Gamma Distribution		95% KM (z) UCL	3.308
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.299
Minimum	1.00E-06	95% KM (bootstrap t) UCL	3.878
Maximum	110	95% KM (BCA) UCL	3.289
Mean	3.155	95% KM (Percentile Bootstrap) UCL	3.286
Median	1.00E-06	95% KM (Chebyshev) UCL	5.005
SD	9.942	97.5% KM (Chebyshev) UCL	6.185
k star	0.085	99% KM (Chebyshev) UCL	8.502
Theta star	37.13		
Nu star	43.84	Potential UCLs to Use	
AppChi2	29.66	95% KM (Chebyshev) UCL	5.005
95% Gamma Approximate UCL	4.663		
95% Adjusted Gamma UCL	4.674		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	67
Number of Distinct Detected Data	50	Number of Non-Detect Data	194
		Percent Non-Detects	74.33%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.105	Minimum Detected	-2.254
Maximum Detected	25.5	Maximum Detected	3.239
Mean of Detected	1.142	Mean of Detected	-0.632
SD of Detected	3.301	SD of Detected	0.974
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.415	Lilliefors Test Statistic	0.112
5% Lilliefors Critical Value	0.108	5% Lilliefors Critical Value	0.108
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.409	Mean	-0.62
SD	28.94	SD	1.431
95% DL/2 (t) UCL	8.367	95% H-Stat (DL/2) UCL	1.873
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.217
		SD in Log Scale	0.814
		Mean in Original Scale	0.509
		SD in Original Scale	1.71
		95% t UCL	0.684
		95% Percentile Bootstrap UCL	0.703
		95% BCA Bootstrap UCL	0.83
		95% H-UCL	0.456
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.753	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.516		
nu star	101		
A-D Test Statistic	5.562	Nonparametric Statistics	
5% A-D Critical Value	0.791	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.791	Mean	0.512
5% K-S Critical Value	0.113	SD	1.748
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.113
		95% KM (t) UCL	0.699
Assuming Gamma Distribution		95% KM (z) UCL	0.698
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.698
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.212
Maximum	25.5	95% KM (BCA) UCL	0.732
Mean	0.635	95% KM (Percentile Bootstrap) UCL	0.721
Median	0.375	95% KM (Chebyshev) UCL	1.004
SD	1.748	97.5% KM (Chebyshev) UCL	1.217
k star	0.183	99% KM (Chebyshev) UCL	1.636
Theta star	3.481		
Nu star	95.28	Potential UCLs to Use	
AppChi2	73.77	95% KM (t) UCL	0.699
95% Gamma Approximate UCL	0.821	95% KM (% Bootstrap) UCL	0.721
95% Adjusted Gamma UCL	0.822		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	27
Number of Distinct Detected Data	23	Number of Non-Detect Data	234
		Percent Non-Detects	89.66%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.22	Minimum Detected	-1.514
Maximum Detected	15	Maximum Detected	2.708
Mean of Detected	1.241	Mean of Detected	-0.668
SD of Detected	3.08	SD of Detected	0.968
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.342	Shapiro Wilk Test Statistic	0.69
5% Shapiro Wilk Critical Value	0.923	5% Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.235	Mean	-0.764
SD	28.94	SD	1.388
95% DL/2 (t) UCL	8.191	95% H-Stat (DL/2) UCL	1.511
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.124
		SD in Log Scale	0.578
		Mean in Original Scale	0.438
		SD in Original Scale	1.023
		95% t UCL	0.543
		95% Percentile Bootstrap UCL	0.553
		95% BCA Bootstrap UCL	0.634
		95% H-UCL	0.41
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.634	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.957		
nu star	34.25		
A-D Test Statistic	5.26	Nonparametric Statistics	
5% A-D Critical Value	0.79	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.79	Mean	0.435
5% K-S Critical Value	0.176	SD	1.046
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0724
		95% KM (t) UCL	0.555
Assuming Gamma Distribution		95% KM (z) UCL	0.554
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.554
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.727
Maximum	15	95% KM (BCA) UCL	0.571
Mean	0.702	95% KM (Percentile Bootstrap) UCL	0.568
Median	0.465	95% KM (Chebyshev) UCL	0.751
SD	1.176	97.5% KM (Chebyshev) UCL	0.887
k star	0.192	99% KM (Chebyshev) UCL	1.155
Theta star	3.66		
Nu star	100.1	Potential UCLs to Use	
AppChi2	77.99	95% KM (t) UCL	0.555
95% Gamma Approximate UCL	0.9	95% KM (% Bootstrap) UCL	0.568
95% Adjusted Gamma UCL	0.901		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	92
Number of Distinct Detected Data	59	Number of Non-Detect Data	169
		Percent Non-Detects	64.75%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.22	Minimum Detected	-1.514
Maximum Detected	280	Maximum Detected	5.635
Mean of Detected	8.479	Mean of Detected	0.937
SD of Detected	31.79	SD of Detected	1.182
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.405	Lilliefors Test Statistic	0.117
5% Lilliefors Critical Value	0.0924	5% Lilliefors Critical Value	0.0924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.002	Mean	-0.04
SD	34.33	SD	1.641
95% DL/2 (t) UCL	11.51	95% H-Stat (DL/2) UCL	4.873
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.639
		SD in Log Scale	1.639
		Mean in Original Scale	3.237
		SD in Original Scale	19.2
		95% t UCL	5.199
		95% Percentile Bootstrap UCL	5.394
		95% BCA Bootstrap UCL	6.825
		95% H-UCL	2.667
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.515	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.45		
nu star	94.82		
A-D Test Statistic	10.3	Nonparametric Statistics	
5% A-D Critical Value	0.816	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.816	Mean	3.372
5% K-S Critical Value	0.0984	SD	19.29
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.21
		95% KM (t) UCL	5.368
Assuming Gamma Distribution		95% KM (z) UCL	5.361
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.361
Minimum	1.00E-06	95% KM (bootstrap t) UCL	10.18
Maximum	280	95% KM (BCA) UCL	5.716
Mean	3.161	95% KM (Percentile Bootstrap) UCL	5.515
Median	1.00E-06	95% KM (Chebyshev) UCL	8.644
SD	19.25	97.5% KM (Chebyshev) UCL	10.93
k star	0.0902	99% KM (Chebyshev) UCL	15.41
Theta star	35.04		
Nu star	47.08	Potential UCLs to Use	
AppChi2	32.33	95% KM (BCA) UCL	5.716
95% Gamma Approximate UCL	4.602		
95% Adjusted Gamma UCL	4.611		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

cis-1,2-Dichloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	224
Number of Distinct Detected Data	156	Number of Non-Detect Data	37
		Percent Non-Detects	14.18%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	390000	Maximum Detected	12.87
Mean of Detected	4407	Mean of Detected	3.834
SD of Detected	28872	SD of Detected	2.987
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.452	Lilliefors Test Statistic	0.0648
5% Lilliefors Critical Value	0.0592	5% Lilliefors Critical Value	0.0592
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3782	Mean	3.094
SD	26783	SD	3.314
95% DL/2 (t) UCL	6519	95% H-Stat (DL/2) UCL	13952
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.991
		SD in Log Scale	3.504
		Mean in Original Scale	3782
		SD in Original Scale	26783
		95% t UCL	6519
		95% Percentile Bootstrap UCL	6827
		95% BCA Bootstrap UCL	8563
		95% H-UCL	26808
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.167	Data do not follow a Discernable Distribution (0.05)	
Theta Star	26404		
nu star	74.77		
A-D Test Statistic	25.27	Nonparametric Statistics	
5% A-D Critical Value	0.985	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.985	Mean	3782
5% K-S Critical Value	0.0691	SD	26732
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1658
		95% KM (t) UCL	6520
Assuming Gamma Distribution		95% KM (z) UCL	6510
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	6519
Minimum	1.00E-06	95% KM (bootstrap t) UCL	11078
Maximum	390000	95% KM (BCA) UCL	7039
Mean	3782	95% KM (Percentile Bootstrap) UCL	6825
Median	26	95% KM (Chebyshev) UCL	11011
SD	26783	97.5% KM (Chebyshev) UCL	14139
k star	0.117	99% KM (Chebyshev) UCL	20283
Theta star	32421		
Nu star	60.9	Potential UCLs to Use	
AppChi2	43.95	97.5% KM (Chebyshev) UCL	14139
95% Gamma Approximate UCL	5241		
95% Adjusted Gamma UCL	5250		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

trans-1,2-Dichloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	84
Number of Distinct Detected Data	74	Number of Non-Detect Data	177
		Percent Non-Detects	67.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	1300	Maximum Detected	7.17
Mean of Detected	52.01	Mean of Detected	1.074
SD of Detected	195.6	SD of Detected	2.13
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	257
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	98.47%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.431	Lilliefors Test Statistic	0.134
5% Lilliefors Critical Value	0.0967	5% Lilliefors Critical Value	0.0967
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	19.31	Mean	-0.247
SD	114.3	SD	1.829
95% DL/2 (t) UCL	30.99	95% H-Stat (DL/2) UCL	5.806
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.922
		SD in Log Scale	2.22
		Mean in Original Scale	16.98
		SD in Original Scale	113.1
		95% t UCL	28.54
		95% Percentile Bootstrap UCL	29.03
		95% BCA Bootstrap UCL	34.48
		95% H-UCL	7.425
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.246	Data do not follow a Discernable Distribution (0.05)	
Theta Star	211.1		
nu star	41.4		
A-D Test Statistic	10.2	Nonparametric Statistics	
5% A-D Critical Value	0.89	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.89	Mean	17.04
5% K-S Critical Value	0.107	SD	112.9
Data not Gamma Distributed at 5% Significance Level		SE of Mean	7.031
		95% KM (t) UCL	28.64
Assuming Gamma Distribution		95% KM (z) UCL	28.6
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	28.6
Minimum	1.00E-06	95% KM (bootstrap t) UCL	41.1
Maximum	1300	95% KM (BCA) UCL	29.71
Mean	16.92	95% KM (Percentile Bootstrap) UCL	28.76
Median	1.00E-06	95% KM (Chebyshev) UCL	47.68
SD	113.1	97.5% KM (Chebyshev) UCL	60.95
k star	0.0737	99% KM (Chebyshev) UCL	87
Theta star	229.6		
Nu star	38.48	Potential UCLs to Use	
AppChi2	25.27	97.5% KM (Chebyshev) UCL	60.95
95% Gamma Approximate UCL	25.77		
95% Adjusted Gamma UCL	25.83		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Methyl tert-butyl ether

General Statistics - Data are in µg/L.

Number of Valid Data	261	Number of Detected Data	111
Number of Distinct Detected Data	85	Number of Non-Detect Data	150
		Percent Non-Detects	57.47%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.1	Minimum Detected	-2.303
Maximum Detected	330	Maximum Detected	5.799
Mean of Detected	10.14	Mean of Detected	0.445
SD of Detected	43.77	SD of Detected	1.633
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.409	Lilliefors Test Statistic	0.136
5% Lilliefors Critical Value	0.0841	5% Lilliefors Critical Value	0.0841
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.333	Mean	-0.085
SD	40.38	SD	1.731
95% DL/2 (t) UCL	13.46	95% H-Stat (DL/2) UCL	5.564
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.519
		SD in Log Scale	1.573
		Mean in Original Scale	4.577
		SD in Original Scale	28.87
		95% t UCL	7.528
		95% Percentile Bootstrap UCL	7.918
		95% BCA Bootstrap UCL	9.442
		95% H-UCL	2.657
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.354	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.6		
nu star	78.68		
A-D Test Statistic	10.33	Nonparametric Statistics	
5% A-D Critical Value	0.854	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.854	Mean	4.656
5% K-S Critical Value	0.0933	SD	29
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.815
		95% KM (t) UCL	7.651
Assuming Gamma Distribution		95% KM (z) UCL	7.641
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.644
Minimum	1.00E-06	95% KM (bootstrap t) UCL	19.5
Maximum	330	95% KM (BCA) UCL	8.139
Mean	4.647	95% KM (Percentile Bootstrap) UCL	8.087
Median	1.00E-06	95% KM (Chebyshev) UCL	12.57
SD	28.91	97.5% KM (Chebyshev) UCL	15.99
k star	0.0993	99% KM (Chebyshev) UCL	22.71
Theta star	46.79		
Nu star	51.85	Potential UCLs to Use	
AppChi2	36.31	95% KM (Chebyshev) UCL	12.57
95% Gamma Approximate UCL	6.636		
95% Adjusted Gamma UCL	6.649		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Methylene chloride

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	21
Number of Distinct Detected Data	20	Number of Non-Detect Data	240
		Percent Non-Detects	91.95%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.23	Minimum Detected	-1.47
Maximum Detected	7	Maximum Detected	1.946
Mean of Detected	1.238	Mean of Detected	-0.292
SD of Detected	1.582	SD of Detected	0.956
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.646	Shapiro Wilk Test Statistic	0.913
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.241	Mean	-0.726
SD	28.92	SD	1.397
95% DL/2 (t) UCL	8.197	95% H-Stat (DL/2) UCL	1.593
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.001
		SD in Log Scale	0.648
		Mean in Original Scale	0.47
		SD in Original Scale	0.538
		95% t UCL	0.525
		95% Percentile Bootstrap UCL	0.527
		95% BCA Bootstrap UCL	0.55
		95% H-UCL	0.489
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.997	Data appear Lognormal at 5% Significance Level	
Theta Star	1.241		
nu star	41.89		
A-D Test Statistic	1.171	Nonparametric Statistics	
5% A-D Critical Value	0.767	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.767	Mean	0.433
5% K-S Critical Value	0.194	SD	0.536
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0428
		95% KM (t) UCL	0.504
Assuming Gamma Distribution		95% KM (z) UCL	0.503
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.504
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.536
Maximum	7	95% KM (BCA) UCL	0.505
Mean	0.703	95% KM (Percentile Bootstrap) UCL	0.506
Median	0.606	95% KM (Chebyshev) UCL	0.619
SD	0.72	97.5% KM (Chebyshev) UCL	0.7
k star	0.239	99% KM (Chebyshev) UCL	0.858
Theta star	2.936		
Nu star	125	Potential UCLs to Use	
AppChi2	100.2	95% KM (t) UCL	0.504
95% Gamma Approximate UCL	0.877	95% KM (% Bootstrap) UCL	0.506
95% Adjusted Gamma UCL	0.878		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Tetrachloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	112
Number of Distinct Detected Data	86	Number of Non-Detect Data	149
		Percent Non-Detects	57.09%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.12	Minimum Detected	-2.12
Maximum Detected	1600	Maximum Detected	7.378
Mean of Detected	20.4	Mean of Detected	0.428
SD of Detected	151.7	SD of Detected	1.551
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	260
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	99.62%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.447	Lilliefors Test Statistic	0.131
5% Lilliefors Critical Value	0.0837	5% Lilliefors Critical Value	0.0837
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.55	Mean	-0.166
SD	103.4	SD	1.669
95% DL/2 (t) UCL	24.11	95% H-Stat (DL/2) UCL	4.542
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.618
		SD in Log Scale	1.574
		Mean in Original Scale	8.972
		SD in Original Scale	99.62
		95% t UCL	19.15
		95% Percentile Bootstrap UCL	21.02
		95% BCA Bootstrap UCL	27.89
		95% H-UCL	2.415
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.27	Data do not follow a Discernable Distribution (0.05)	
Theta Star	75.64		
nu star	60.4		
A-D Test Statistic	19.72	Nonparametric Statistics	
5% A-D Critical Value	0.881	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.881	Mean	9.055
5% K-S Critical Value	0.0943	SD	99.44
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.184
		95% KM (t) UCL	19.26
Assuming Gamma Distribution		95% KM (z) UCL	19.23
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	19.24
Minimum	1.00E-06	95% KM (bootstrap t) UCL	85.98
Maximum	1600	95% KM (BCA) UCL	21.14
Mean	9.132	95% KM (Percentile Bootstrap) UCL	21.32
Median	1.00E-06	95% KM (Chebyshev) UCL	36.01
SD	99.65	97.5% KM (Chebyshev) UCL	47.67
k star	0.0882	99% KM (Chebyshev) UCL	70.59
Theta star	103.5		
Nu star	46.05	Potential UCLs to Use	
AppChi2	31.48	95% KM (Chebyshev) UCL	36.01
95% Gamma Approximate UCL	13.36		
95% Adjusted Gamma UCL	13.39		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2,3-Trichlorobenzene

General Statistics - Data are in µg/L.			
Number of Valid Data	258	Number of Detected Data	36
Number of Distinct Detected Data	32	Number of Non-Detect Data	222
		Percent Non-Detects	86.05%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.12	Minimum Detected	-2.12
Maximum Detected	280	Maximum Detected	5.635
Mean of Detected	19.25	Mean of Detected	1.013
SD of Detected	50.35	SD of Detected	1.914
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	258
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.429	Shapiro Wilk Test Statistic	0.928
5% Shapiro Wilk Critical Value	0.935	5% Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.654	Mean	-0.562
SD	34.77	SD	1.606
95% DL/2 (t) UCL	11.23	95% H-Stat (DL/2) UCL	2.71
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.207
		SD in Log Scale	2.201
		Mean in Original Scale	2.856
		SD in Original Scale	19.73
		95% t UCL	4.883
		95% Percentile Bootstrap UCL	5.055
		95% BCA Bootstrap UCL	6.391
		95% H-UCL	1.962
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.336	Data do not follow a Discernable Distribution (0.05)	
Theta Star	57.28		
nu star	24.2		
A-D Test Statistic	3.064	Nonparametric Statistics	
5% A-D Critical Value	0.846	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.846	Mean	2.955
5% K-S Critical Value	0.158	SD	19.83
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.262
		95% KM (t) UCL	5.038
Assuming Gamma Distribution		95% KM (z) UCL	5.03
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.013
Minimum	1.00E-06	95% KM (bootstrap t) UCL	7.974
Maximum	280	95% KM (BCA) UCL	5.313
Mean	3.129	95% KM (Percentile Bootstrap) UCL	5.309
Median	1.00E-06	95% KM (Chebyshev) UCL	8.455
SD	19.77	97.5% KM (Chebyshev) UCL	10.83
k star	0.0736	99% KM (Chebyshev) UCL	15.51
Theta star	42.54		
Nu star	37.96	Potential UCLs to Use	
AppChi2	24.85	95% KM (Chebyshev) UCL	8.455
95% Gamma Approximate UCL	4.779		
95% Adjusted Gamma UCL	4.791		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2,4-Trichlorobenzene

General Statistics - Data are in µg/L.			
Number of Valid Data	258	Number of Detected Data	44
Number of Distinct Detected Data	36	Number of Non-Detect Data	214
		Percent Non-Detects	82.95%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.1	Minimum Detected	-2.303
Maximum Detected	1600	Maximum Detected	7.378
Mean of Detected	88.77	Mean of Detected	2.116
SD of Detected	253.4	SD of Detected	2.329
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	257
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	99.61%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.387	Shapiro Wilk Test Statistic	0.953
5% Shapiro Wilk Critical Value	0.944	5% Shapiro Wilk Critical Value	0.944
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	18.49	Mean	-0.401
SD	111	SD	1.862
95% DL/2 (t) UCL	29.89	95% H-Stat (DL/2) UCL	5.344
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.639
		SD in Log Scale	2.751
		Mean in Original Scale	15.47
		SD in Original Scale	108.9
		95% t UCL	26.66
		95% Percentile Bootstrap UCL	27.59
		95% BCA Bootstrap UCL	38.91
		95% H-UCL	16.93
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.287	Data appear Lognormal at 5% Significance Level	
Theta Star	308.8		
nu star	25.3		
A-D Test Statistic	2.611	Nonparametric Statistics	
5% A-D Critical Value	0.864	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.864	Mean	15.53
5% K-S Critical Value	0.145	SD	108.7
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.854
		95% KM (t) UCL	26.85
Assuming Gamma Distribution		95% KM (z) UCL	26.81
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.74
Minimum	1.00E-06	95% KM (bootstrap t) UCL	44.51
Maximum	1600	95% KM (BCA) UCL	28.11
Mean	15.64	95% KM (Percentile Bootstrap) UCL	28.04
Median	1.00E-06	95% KM (Chebyshev) UCL	45.41
SD	108.9	97.5% KM (Chebyshev) UCL	58.34
k star	0.0661	99% KM (Chebyshev) UCL	83.73
Theta star	236.5		
Nu star	34.13	Potential UCLs to Use	
AppChi2	21.77	97.5% KM (Chebyshev) UCL	58.34
95% Gamma Approximate UCL	24.52		
95% Adjusted Gamma UCL	24.59		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1,2-Trichloroethane

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	26
Number of Distinct Detected Data	26	Number of Non-Detect Data	235
		Percent Non-Detects	90.04%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.265	Minimum Detected	-1.328
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	10.37	Mean of Detected	0.618
SD of Detected	26.74	SD of Detected	1.635
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.426	Shapiro Wilk Test Statistic	0.864
5% Shapiro Wilk Critical Value	0.92	5% Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.117	Mean	-0.649
SD	30.09	SD	1.498
95% DL/2 (t) UCL	9.192	95% H-Stat (DL/2) UCL	2.039
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.047
		SD in Log Scale	1.23
		Mean in Original Scale	1.444
		SD in Original Scale	8.818
		95% t UCL	2.345
		95% Percentile Bootstrap UCL	2.504
		95% BCA Bootstrap UCL	3.055
		95% H-UCL	0.893
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.366	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.33		
nu star	19.03		
A-D Test Statistic	3.182	Nonparametric Statistics	
5% A-D Critical Value	0.833	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.833	Mean	1.444
5% K-S Critical Value	0.184	SD	8.889
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.568
		95% KM (t) UCL	2.382
Assuming Gamma Distribution		95% KM (z) UCL	2.378
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.366
Minimum	1.00E-06	95% KM (bootstrap t) UCL	5.641
Maximum	120	95% KM (BCA) UCL	2.534
Mean	2.496	95% KM (Percentile Bootstrap) UCL	2.477
Median	1.00E-06	95% KM (Chebyshev) UCL	3.92
SD	9.185	97.5% KM (Chebyshev) UCL	4.991
k star	0.0926	99% KM (Chebyshev) UCL	7.095
Theta star	26.95		
Nu star	48.35	Potential UCLs to Use	
AppChi2	33.39	95% KM (Chebyshev) UCL	3.92
95% Gamma Approximate UCL	3.615		
95% Adjusted Gamma UCL	3.623		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	237
Number of Distinct Detected Data	157	Number of Non-Detect Data	24
		Percent Non-Detects	9.20%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.28	Minimum Detected	-1.273
Maximum Detected	170000	Maximum Detected	12.04
Mean of Detected	2444	Mean of Detected	4.265
SD of Detected	13070	SD of Detected	2.802
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.426	Lilliefors Test Statistic	0.0472
5% Lilliefors Critical Value	0.0576	5% Lilliefors Critical Value	0.0576
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2219	Mean	3.745
SD	12472	SD	3.131
95% DL/2 (t) UCL	3494	95% H-Stat (DL/2) UCL	13510
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1082	Mean in Log Scale	3.711
SD	13310	SD in Log Scale	3.21
95% MLE (t) UCL	2442	Mean in Original Scale	2219
95% MLE (Tiku) UCL	2336	SD in Original Scale	12472
		95% t UCL	3494
		95% Percentile Bootstrap UCL	3642
		95% BCA Bootstrap UCL	4366
		95% H UCL	17417
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.207	Data appear Lognormal at 5% Significance Level	
Theta Star	11797		
nu star	98.2		
A-D Test Statistic	17.46	Nonparametric Statistics	
5% A-D Critical Value	0.912	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.912	Mean	2219
5% K-S Critical Value	0.0657	SD	12448
Data not Gamma Distributed at 5% Significance Level		SE of Mean	772.2
		95% KM (t) UCL	3494
Assuming Gamma Distribution		95% KM (z) UCL	3489
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3494
Minimum	1.00E-06	95% KM (bootstrap t) UCL	5289
Maximum	170000	95% KM (BCA) UCL	3679
Mean	2219	95% KM (Percentile Bootstrap) UCL	3612
Median	40	95% KM (Chebyshev) UCL	5585
SD	12472	97.5% KM (Chebyshev) UCL	7041
k star	0.151	99% KM (Chebyshev) UCL	9902
Theta star	14661		
Nu star	79.01	Potential UCLs to Use	
AppChi2	59.54	97.5% KM (Chebyshev) UCL	7041
95% Gamma Approximate UCL	2945		
95% Adjusted Gamma UCL	2950		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Vinyl chloride

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	64
Number of Distinct Detected Data	57	Number of Non-Detect Data	197
		Percent Non-Detects	75.48%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.36	Minimum Detected	-1.022
Maximum Detected	860	Maximum Detected	6.757
Mean of Detected	74.11	Mean of Detected	2.311
SD of Detected	168.9	SD of Detected	2.133
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	257
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	98.47%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.331	Lilliefors Test Statistic	0.142
5% Lilliefors Critical Value	0.111	5% Lilliefors Critical Value	0.111
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	20.89	Mean	-0.093
SD	90.54	SD	2.044
95% DL/2 (t) UCL	30.14	95% H-Stat (DL/2) UCL	10.99
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.04
		SD in Log Scale	3.443
		Mean in Original Scale	18.31
		SD in Original Scale	89.05
		95% t UCL	27.41
		95% Percentile Bootstrap UCL	28.09
		95% BCA Bootstrap UCL	31.42
		95% H-UCL	136.8
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.333	Data do not follow a Discernable Distribution (0.05)	
Theta Star	222.2		
nu star	42.68		
A-D Test Statistic	3.144	Nonparametric Statistics	
5% A-D Critical Value	0.855	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.855	Mean	18.57
5% K-S Critical Value	0.12	SD	88.88
Data not Gamma Distributed at 5% Significance Level		SE of Mean	5.549
		95% KM (t) UCL	27.73
Assuming Gamma Distribution		95% KM (z) UCL	27.7
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	27.68
Minimum	1.00E-06	95% KM (bootstrap t) UCL	31.92
Maximum	860	95% KM (BCA) UCL	28.84
Mean	18.17	95% KM (Percentile Bootstrap) UCL	27.96
Median	1.00E-06	95% KM (Chebyshev) UCL	42.76
SD	89.08	97.5% KM (Chebyshev) UCL	53.23
k star	0.0685	99% KM (Chebyshev) UCL	73.78
Theta star	265.4		
Nu star	35.74	Potential UCLs to Use	
AppChi2	23.06	97.5% KM (Chebyshev) UCL	53.23
95% Gamma Approximate UCL	28.16		
95% Adjusted Gamma UCL	28.23		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Bis(2-ethylhexyl)phthalate

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	29
Number of Distinct Detected Data	26	Number of Non-Detect Data	233
		Percent Non-Detects	88.93%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.1	Minimum Detected	0.0953
Maximum Detected	220	Maximum Detected	5.394
Mean of Detected	13.81	Mean of Detected	1.535
SD of Detected	40.81	SD of Detected	1.101
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5.6	Maximum Non-Detect	1.723
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	255
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.33%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.311	Shapiro Wilk Test Statistic	0.811
5% Shapiro Wilk Critical Value	0.926	5% Shapiro Wilk Critical Value	0.926
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.756	Mean	0.986
SD	13.83	SD	0.41
95% DL/2 (t) UCL	5.166	95% H-Stat (DL/2) UCL	3.048
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.117
		SD in Log Scale	0.742
		Mean in Original Scale	4.712
		SD in Original Scale	13.92
		95% t UCL	6.132
		95% Percentile Bootstrap UCL	6.3
		95% BCA Bootstrap UCL	7.438
		95% H-UCL	4.4
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.535	Data do not follow a Discernable Distribution (0.05)	
Theta Star	25.83		
nu star	31.01		
A-D Test Statistic	4.539	Nonparametric Statistics	
5% A-D Critical Value	0.804	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.804	Mean	4.186
5% K-S Critical Value	0.171	SD	13.8
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.892
		95% KM (t) UCL	5.659
Assuming Gamma Distribution		95% KM (z) UCL	5.654
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.641
Minimum	1.00E-06	95% KM (bootstrap t) UCL	8.548
Maximum	220	95% KM (BCA) UCL	5.731
Mean	9.005	95% KM (Percentile Bootstrap) UCL	5.801
Median	3.858	95% KM (Chebyshev) UCL	8.076
SD	16.31	97.5% KM (Chebyshev) UCL	9.76
k star	0.142	99% KM (Chebyshev) UCL	13.07
Theta star	63.45		
Nu star	74.36	Potential UCLs to Use	
AppChi2	55.5	95% KM (BCA) UCL	5.731
95% Gamma Approximate UCL	12.06		
95% Adjusted Gamma UCL	12.08		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Dibenzo(a,h)anthracene

General Statistics - Data are in µg/L.			
Number of Valid Data	260	Number of Detected Data	31
Number of Distinct Detected Data	18	Number of Non-Detect Data	229
		Percent Non-Detects	88.08%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0735	Minimum Detected	-2.61
Maximum Detected	5.5	Maximum Detected	1.705
Mean of Detected	0.381	Mean of Detected	-1.887
SD of Detected	1.036	SD of Detected	0.947
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	5	Maximum Non-Detect	1.609
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	259
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	99.62%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.314	Shapiro Wilk Test Statistic	0.598
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0993	Mean	-2.843
SD	0.398	SD	0.537
95% DL/2 (t) UCL	0.14	95% H-Stat (DL/2) UCL	0.0715
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.566
		SD in Log Scale	0.591
		Mean in Original Scale	0.113
		SD in Original Scale	0.367
		95% t UCL	0.151
		95% Percentile Bootstrap UCL	0.155
		95% BCA Bootstrap UCL	0.179
		95% H-UCL	0.0979
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.618	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.618		
nu star	38.3		
A-D Test Statistic	7.093	Nonparametric Statistics	
5% A-D Critical Value	0.796	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.796	Mean	0.126
5% K-S Critical Value	0.165	SD	0.364
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0231
		95% KM (t) UCL	0.165
Assuming Gamma Distribution		95% KM (z) UCL	0.164
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.164
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.366
Maximum	5.5	95% KM (BCA) UCL	0.174
Mean	0.148	95% KM (Percentile Bootstrap) UCL	0.168
Median	0.0748	95% KM (Chebyshev) UCL	0.227
SD	0.387	97.5% KM (Chebyshev) UCL	0.271
k star	0.166	99% KM (Chebyshev) UCL	0.356
Theta star	0.894		
Nu star	86.15	Potential UCLs to Use	
AppChi2	65.76	95% KM (t) UCL	0.165
95% Gamma Approximate UCL	0.194	95% KM (% Bootstrap) UCL	0.168
95% Adjusted Gamma UCL	0.194		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Indeno(1,2,3-cd)pyrene

General Statistics - Data are in µg/L.

Number of Valid Data	261	Number of Detected Data	60
Number of Distinct Detected Data	14	Number of Non-Detect Data	201
		Percent Non-Detects	77.01%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.08	Minimum Detected	-2.526
Maximum Detected	3.1	Maximum Detected	1.131
Mean of Detected	0.242	Mean of Detected	-1.881
SD of Detected	0.514	SD of Detected	0.649
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	5	Maximum Non-Detect	1.609
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.447	Lilliefors Test Statistic	0.36
5% Lilliefors Critical Value	0.114	5% Lilliefors Critical Value	0.114
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.104	Mean	-2.723
SD	0.298	SD	0.605
95% DL/2 (t) UCL	0.134	95% H-Stat (DL/2) UCL	0.0846
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-3.239
		SD in Log Scale	1.049
		Mean in Original Scale	0.0814
		SD in Original Scale	0.261
		95% t UCL	0.108
		95% Percentile Bootstrap UCL	0.111
		95% BCA Bootstrap UCL	0.124
		95% H-UCL	0.0783
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.173	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.206		
nu star	140.8		
A-D Test Statistic	13.2	Nonparametric Statistics	
5% A-D Critical Value	0.775	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.775	Mean	0.117
5% K-S Critical Value	0.117	SD	0.254
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0159
		95% KM (t) UCL	0.144
Assuming Gamma Distribution		95% KM (z) UCL	0.143
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.139
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.23
Maximum	3.1	95% KM (BCA) UCL	0.163
Mean	0.0567	95% KM (Percentile Bootstrap) UCL	0.154
Median	1.00E-06	95% KM (Chebyshev) UCL	0.187
SD	0.265	97.5% KM (Chebyshev) UCL	0.217
k star	0.104	99% KM (Chebyshev) UCL	0.275
Theta star	0.543		
Nu star	54.51	Potential UCLs to Use	
AppChi2	38.54	95% KM (t) UCL	0.144
95% Gamma Approximate UCL	0.0802	95% KM (% Bootstrap) UCL	0.154
95% Adjusted Gamma UCL	0.0804		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	65
Number of Distinct Detected Data	31	Number of Non-Detect Data	197
		Percent Non-Detects	75.19%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.03	Minimum Detected	-3.507
Maximum Detected	14	Maximum Detected	2.639
Mean of Detected	0.635	Mean of Detected	-1.628
SD of Detected	1.96	SD of Detected	1.122
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	211
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	51
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	80.53%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.429	Lilliefors Test Statistic	0.265
5% Lilliefors Critical Value	0.11	5% Lilliefors Critical Value	0.11
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.195	Mean	-2.656
SD	1.003	SD	0.811
95% DL/2 (t) UCL	0.298	95% H-Stat (DL/2) UCL	0.108
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.87
		SD in Log Scale	1.16
		Mean in Original Scale	0.195
		SD in Original Scale	1.004
		95% t UCL	0.298
		95% Percentile Bootstrap UCL	0.313
		95% BCA Bootstrap UCL	0.381
		95% H-UCL	0.131
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.521	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.22		
nu star	67.69		
A-D Test Statistic	11.99	Nonparametric Statistics	
5% A-D Critical Value	0.813	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.813	Mean	0.216
5% K-S Critical Value	0.117	SD	0.998
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0624
		95% KM (t) UCL	0.319
Assuming Gamma Distribution		95% KM (z) UCL	0.318
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.318
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.477
Maximum	14	95% KM (BCA) UCL	0.341
Mean	0.185	95% KM (Percentile Bootstrap) UCL	0.327
Median	1.00E-06	95% KM (Chebyshev) UCL	0.488
SD	1.008	97.5% KM (Chebyshev) UCL	0.606
k star	0.108	99% KM (Chebyshev) UCL	0.837
Theta star	1.716		
Nu star	56.56	Potential UCLs to Use	
AppChi2	40.27	95% KM (BCA) UCL	0.341
95% Gamma Approximate UCL	0.26		
95% Adjusted Gamma UCL	0.261		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Total Polychlorinated Biphenyls

General Statistics - Data are in µg/L.			
Number of Valid Data	259	Number of Detected Data	72
Number of Distinct Detected Data	64	Number of Non-Detect Data	187
		Percent Non-Detects	72.20%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.031	Minimum Detected	-3.474
Maximum Detected	81	Maximum Detected	4.394
Mean of Detected	5.116	Mean of Detected	-0.502
SD of Detected	13.84	SD of Detected	2.041
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	202
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	57
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	77.99%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.357	Lilliefors Test Statistic	0.151
5% Lilliefors Critical Value	0.104	5% Lilliefors Critical Value	0.104
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.449	Mean	-2.55
SD	7.612	SD	1.684
95% DL/2 (t) UCL	2.23	95% H-Stat (DL/2) UCL	0.431
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.193
		SD in Log Scale	3.168
		Mean in Original Scale	1.435
		SD in Original Scale	7.614
		95% t UCL	2.216
		95% Percentile Bootstrap UCL	2.263
		95% BCA Bootstrap UCL	2.663
		95% H-UCL	5.533
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.316	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.2		
nu star	45.47		
A-D Test Statistic	5.421	Nonparametric Statistics	
5% A-D Critical Value	0.861	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.861	Mean	1.451
5% K-S Critical Value	0.114	SD	7.596
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.475
		95% KM (t) UCL	2.236
Assuming Gamma Distribution		95% KM (z) UCL	2.233
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.232
Minimum	1.00E-06	95% KM (bootstrap t) UCL	2.906
Maximum	81	95% KM (BCA) UCL	2.417
Mean	1.422	95% KM (Percentile Bootstrap) UCL	2.267
Median	1.00E-06	95% KM (Chebyshev) UCL	3.523
SD	7.617	97.5% KM (Chebyshev) UCL	4.419
k star	0.0814	99% KM (Chebyshev) UCL	6.18
Theta star	17.48		
Nu star	42.15	Potential UCLs to Use	
AppChi2	28.27	97.5% KM (Chebyshev) UCL	4.419
95% Gamma Approximate UCL	2.121		
95% Adjusted Gamma UCL	2.125		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

gamma-Chlordane

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	15
Number of Distinct Detected Data	15	Number of Non-Detect Data	246
		Percent Non-Detects	94.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.029	Minimum Detected	-3.54
Maximum Detected	21	Maximum Detected	3.045
Mean of Detected	2.542	Mean of Detected	-1.26
SD of Detected	5.644	SD of Detected	2.171
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	26	Maximum Non-Detect	3.258
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	261
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.523	Shapiro Wilk Test Statistic	0.882
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.22	Mean	-3.513
SD	1.64	SD	0.845
95% DL/2 (t) UCL	0.387	95% H-Stat (DL/2) UCL	0.0473
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-3.968
		SD in Log Scale	1.62
		Mean in Original Scale	0.181
		SD in Original Scale	1.435
		95% t UCL	0.328
		95% Percentile Bootstrap UCL	0.348
		95% BCA Bootstrap UCL	0.473
		95% H-UCL	0.0922
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.294	Data appear Lognormal at 5% Significance Level	
Theta Star	8.636		
nu star	8.83		
A-D Test Statistic	1.409	Nonparametric Statistics	
5% A-D Critical Value	0.833	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.833	Mean	0.175
5% K-S Critical Value	0.24	SD	1.435
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0921
		95% KM (t) UCL	0.327
Assuming Gamma Distribution		95% KM (z) UCL	0.327
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.322
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.554
Maximum	21	95% KM (BCA) UCL	0.353
Mean	0.473	95% KM (Percentile Bootstrap) UCL	0.341
Median	1.00E-06	95% KM (Chebyshev) UCL	0.577
SD	1.564	97.5% KM (Chebyshev) UCL	0.75
k star	0.0952	99% KM (Chebyshev) UCL	1.091
Theta star	4.962		
Nu star	49.71	Potential UCLs to Use	
AppChi2	34.52	97.5% KM (Chebyshev) UCL	0.75
95% Gamma Approximate UCL (Use when n >= 40)	0.68		
95% Adjusted Gamma UCL (Use when n < 40)	0.682		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

4,4'-DDD

General Statistics - Data are in µg/L.			
Number of Valid Data	83	Number of Detected Data	12
Number of Distinct Detected Data	12	Number of Non-Detect Data	71
		Percent Non-Detects	85.54%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.09	Minimum Detected	-2.408
Maximum Detected	2.2	Maximum Detected	0.788
Mean of Detected	0.652	Mean of Detected	-0.853
SD of Detected	0.605	SD of Detected	1.026
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	72
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.75%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.943
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.138	Mean	-2.669
SD	0.307	SD	0.84
95% DL/2 (t) UCL	0.194	95% H-Stat (DL/2) UCL	0.12
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.912
		SD in Log Scale	1.381
		Mean in Original Scale	0.148
		SD in Original Scale	0.309
		95% t UCL	0.205
		95% Percentile Bootstrap UCL	0.205
		95% BCA Bootstrap UCL	0.221
		95% H-UCL	0.211
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.044	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.624		
nu star	25.05		
A-D Test Statistic	0.282	Nonparametric Statistics	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	0.171
5% K-S Critical Value	0.251	SD	0.296
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0339
		95% KM (t) UCL	0.228
Assuming Gamma Distribution		95% KM (z) UCL	0.227
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.216
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.252
Maximum	2.2	95% KM (BCA) UCL	0.386
Mean	0.181	95% KM (Percentile Bootstrap) UCL	0.259
Median	1.00E-06	95% KM (Chebyshev) UCL	0.319
SD	0.335	97.5% KM (Chebyshev) UCL	0.383
k star	0.125	99% KM (Chebyshev) UCL	0.509
Theta star	1.455		
Nu star	20.7	Potential UCLs to Use	
AppChi2	11.37	95% KM (t) UCL	0.228
95% Gamma Approximate UCL (Use when n >= 40)	0.33		
95% Adjusted Gamma UCL (Use when n < 40)	0.334		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

4,4'-DDE

General Statistics - Data are in µg/L.			
Number of Valid Data	257	Number of Detected Data	15
Number of Distinct Detected Data	15	Number of Non-Detect Data	242
		Percent Non-Detects	94.16%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.085	Minimum Detected	-2.465
Maximum Detected	9.8	Maximum Detected	2.282
Mean of Detected	1.824	Mean of Detected	-0.415
SD of Detected	2.816	SD of Detected	1.508
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	244
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	13
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.94%

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.66	Shapiro Wilk Test Statistic	0.944
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.154	Mean	-2.838
SD	0.779	SD	0.7
95% DL/2 (t) UCL	0.234	95% H-Stat (DL/2) UCL	0.0814

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.972
		SD in Log Scale	1.448
		Mean in Original Scale	0.189
		SD in Original Scale	0.781
		95% t UCL	0.27
		95% Percentile Bootstrap UCL	0.281
		95% BCA Bootstrap UCL	0.317
		95% H-UCL	0.184

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.53	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.441		
nu star	15.91		

A-D Test Statistic	0.691	Nonparametric Statistics	
5% A-D Critical Value	0.785	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.785	Mean	0.191
5% K-S Critical Value	0.232	SD	0.773
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.05
		95% KM (t) UCL	0.274
Assuming Gamma Distribution		95% KM (z) UCL	0.274
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.272
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.444
Maximum	9.8	95% KM (BCA) UCL	0.311
Mean	0.443	95% KM (Percentile Bootstrap) UCL	0.291
Median	1.00E-06	95% KM (Chebyshev) UCL	0.409
SD	0.927	97.5% KM (Chebyshev) UCL	0.504
k star	0.112	99% KM (Chebyshev) UCL	0.689
Theta star	3.971		
Nu star	57.36	Potential UCLs to Use	
AppChi2	40.95	95% KM (t) UCL	0.274
95% Gamma Approximate UCL (Use when n >= 40)	0.621		
95% Adjusted Gamma UCL (Use when n < 40)	0.622		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

4,4'-DDT

General Statistics - Data are in µg/L.			
Number of Valid Data	255	Number of Detected Data	21
Number of Distinct Detected Data	19	Number of Non-Detect Data	234
		Percent Non-Detects	91.76%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.13	Minimum Detected	-2.04
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	2.272	Mean of Detected	-0.224
SD of Detected	4.266	SD of Detected	1.391
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	234
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	21
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	91.76%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.531	Shapiro Wilk Test Statistic	0.936
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.233	Mean	-2.761
SD	1.344	SD	0.856
95% DL/2 (t) UCL	0.372	95% H-Stat (DL/2) UCL	0.102
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.434
		SD in Log Scale	3.882
		Mean in Original Scale	0.194
		SD in Original Scale	1.35
		95% t UCL	0.334
		95% Percentile Bootstrap UCL	0.343
		95% BCA Bootstrap UCL	0.434
		95% H-UCL	4.096
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.54	Data appear Lognormal at 5% Significance Level	
Theta Star	4.209		
nu star	22.67		
A-D Test Statistic	1.297	Nonparametric Statistics	
5% A-D Critical Value	0.797	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.797	Mean	0.306
5% K-S Critical Value	0.199	SD	1.332
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0855
		95% KM (t) UCL	0.447
Assuming Gamma Distribution		95% KM (z) UCL	0.447
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.424
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.802
Maximum	17	95% KM (BCA) UCL	0.494
Mean	0.187	95% KM (Percentile Bootstrap) UCL	0.467
Median	1.00E-06	95% KM (Chebyshev) UCL	0.679
SD	1.351	97.5% KM (Chebyshev) UCL	0.84
k star	0.0778	99% KM (Chebyshev) UCL	1.157
Theta star	2.404		
Nu star	39.7	Potential UCLs to Use	
AppChi2	26.26	95% KM (BCA) UCL	0.494
95% Gamma Approximate UCL (Use when n >= 40)	0.283		
95% Adjusted Gamma UCL (Use when n < 40)	0.283		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Heptachlor

General Statistics - Data are in µg/L.			
Number of Valid Data	261	Number of Detected Data	15
Number of Distinct Detected Data	15	Number of Non-Detect Data	246
		Percent Non-Detects	94.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0615	Minimum Detected	-2.789
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	9.244	Mean of Detected	-0.278
SD of Detected	30.68	SD of Detected	2.002
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.056	Maximum Non-Detect	-2.882
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	246
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	15
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.25%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.325	Shapiro Wilk Test Statistic	0.912
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.555	Mean	-3.482
SD	7.438	SD	0.919
95% DL/2 (t) UCL	1.315	95% H-Stat (DL/2) UCL	0.0528
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-12.53
		SD in Log Scale	5.979
		Mean in Original Scale	0.532
		SD in Original Scale	7.439
		95% t UCL	1.293
		95% Percentile Bootstrap UCL	1.446
		95% BCA Bootstrap UCL	2.363
		95% H-UCL	4146
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.268	Data appear Lognormal at 5% Significance Level	
Theta Star	34.55		
nu star	8.028		
A-D Test Statistic	1.958	Nonparametric Statistics	
5% A-D Critical Value	0.844	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.844	Mean	0.589
5% K-S Critical Value	0.241	SD	7.421
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.475
		95% KM (t) UCL	1.374
Assuming Gamma Distribution		95% KM (z) UCL	1.371
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.321
Minimum	1.00E-06	95% KM (bootstrap t) UCL	12.2
Maximum	120	95% KM (BCA) UCL	1.954
Mean	0.531	95% KM (Percentile Bootstrap) UCL	1.514
Median	1.00E-06	95% KM (Chebyshev) UCL	2.662
SD	7.439	97.5% KM (Chebyshev) UCL	3.559
k star	0.0702	99% KM (Chebyshev) UCL	5.32
Theta star	7.57		
Nu star	36.63	Potential UCLs to Use	
AppChi2	23.78	97.5% KM (Chebyshev) UCL	3.559
95% Gamma Approximate UCL (Use when n >= 40)	0.818		
95% Adjusted Gamma UCL (Use when n < 40)	0.82		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

2,3,7,8-TCDD Toxic Equivalence TEQ (pg/L)

General Statistics - Data are in pg/L.			
Number of Valid Observations	37	Number of Distinct Observations	37
Raw Statistics		Log-transformed Statistics	
Minimum	8.10E-04	Minimum of Log Data	-7.118
Maximum	54	Maximum of Log Data	3.989
Mean	5.452	Mean of log Data	-1.406
Median	0.23	SD of log Data	3.038
SD	12.63		
Std. Error of Mean	2.076		
Coefficient of Variation	2.316		
Skewness	2.82		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.956	95% H-UCL	364.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	59.92
95% Adjusted-CLT UCL (Chen-1995)	9.894	97.5% Chebyshev (MVUE) UCL	79.62
95% Modified-t UCL (Johnson-1978)	9.116	99% Chebyshev (MVUE) UCL	118.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.231	Data appear Lognormal at 5% Significance Level	
Theta Star	23.6		
MLE of Mean	5.452		
MLE of Standard Deviation	11.34		
nu star	17.09		
Approximate Chi Square Value (.05)	8.738	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	8.866
Adjusted Chi Square Value	8.479	95% Jackknife UCL	8.956
		95% Standard Bootstrap UCL	8.797
Anderson-Darling Test Statistic	1.676	95% Bootstrap-t UCL	11.47
Anderson-Darling 5% Critical Value	0.887	95% Hall's Bootstrap UCL	9.015
Kolmogorov-Smirnov Test Statistic	0.185	95% Percentile Bootstrap UCL	9.114
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	10.03
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.5
		97.5% Chebyshev(Mean, Sd) UCL	18.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.1
95% Approximate Gamma UCL	10.66		
95% Adjusted Gamma UCL	10.99		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	26.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Aluminum

General Statistics - Data are in µg/L.			
Number of Valid Data	252	Number of Detected Data	79
Number of Distinct Detected Data	76	Number of Non-Detect Data	173
		Percent Non-Detects	68.65%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	12.1	Minimum Detected	2.493
Maximum Detected	6210	Maximum Detected	8.734
Mean of Detected	436.5	Mean of Detected	5.028
SD of Detected	1044	SD of Detected	1.259
Minimum Non-Detect	200	Minimum Non-Detect	5.298
Maximum Non-Detect	200	Maximum Non-Detect	5.298
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.352	Lilliefors Test Statistic	0.129
5% Lilliefors Critical Value	0.0997	5% Lilliefors Critical Value	0.0997
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	205.5	Mean	4.738
SD	602.7	SD	0.729
95% DL/2 (t) UCL	268.2	95% H-Stat (DL/2) UCL	162.7
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	4.571
		SD in Log Scale	1.049
		Mean in Original Scale	211.3
		SD in Original Scale	605.6
		95% t UCL	274.3
		95% Percentile Bootstrap UCL	281.5
		95% BCA Bootstrap UCL	304.6
		95% H-UCL	193.5
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.575	Data do not follow a Discernable Distribution (0.05)	
Theta Star	758.5		
nu star	90.92		
A-D Test Statistic	6.23	Nonparametric Statistics	
5% A-D Critical Value	0.81	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.81	Mean	197.8
5% K-S Critical Value	0.106	SD	604.2
Data not Gamma Distributed at 5% Significance Level		SE of Mean	38.65
		95% KM (t) UCL	261.6
Assuming Gamma Distribution		95% KM (z) UCL	261.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	261.4
Minimum	1.00E-06	95% KM (bootstrap t) UCL	318.3
Maximum	6210	95% KM (BCA) UCL	268.1
Mean	294	95% KM (Percentile Bootstrap) UCL	270
Median	106.5	95% KM (Chebyshev) UCL	366.3
SD	632.5	97.5% KM (Chebyshev) UCL	439.2
k star	0.135	99% KM (Chebyshev) UCL	582.3
Theta star	2173		
Nu star	68.18	Potential UCLs to Use	
AppChi2	50.17	95% KM (BCA) UCL	268.1
95% Gamma Approximate UCL	399.5		
95% Adjusted Gamma UCL	400.2		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics - Data are in µg/L.

Number of Valid Observations	262	Number of Distinct Observations	185
Raw Statistics		Log-transformed Statistics	
Minimum	0.68	Minimum of Log Data	-0.386
Maximum	829	Maximum of Log Data	6.72
Mean	47.72	Mean of log Data	2.485
Median	10.5	SD of log Data	1.66
SD	105		
Std. Error of Mean	6.487		
Coefficient of Variation	2.2		
Skewness	4.451		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.327	Lilliefors Test Statistic	0.0985
Lilliefors Critical Value	0.0547	Lilliefors Critical Value	0.0547
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	58.43	95% H-UCL	63.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	78.6
95% Adjusted-CLT UCL (Chen-1995)	60.3	97.5% Chebyshev (MVUE) UCL	92.27
95% Modified-t UCL (Johnson-1978)	58.73	99% Chebyshev (MVUE) UCL	119.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.463	Data do not follow a Discernable Distribution (0.05)	
Theta Star	103.1		
MLE of Mean	47.72		
MLE of Standard Deviation	70.16		
nu star	242.4		
Approximate Chi Square Value (.05)	207.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0491	95% CLT UCL	58.39
Adjusted Chi Square Value	207.2	95% Jackknife UCL	58.43
		95% Standard Bootstrap UCL	58.34
Anderson-Darling Test Statistic	10.97	95% Bootstrap-t UCL	61.38
Anderson-Darling 5% Critical Value	0.83	95% Hall's Bootstrap UCL	60.77
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	59.19
Kolmogorov-Smirnov 5% Critical Value	0.06	95% BCA Bootstrap UCL	60.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76
		97.5% Chebyshev(Mean, Sd) UCL	88.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	112.3
95% Approximate Gamma UCL	55.79		
95% Adjusted Gamma UCL	55.83		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	76

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	261
Number of Distinct Detected Data	233	Number of Non-Detect Data	1
		Percent Non-Detects	0.38%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	8.7	Minimum Detected	2.163
Maximum Detected	8790	Maximum Detected	9.081
Mean of Detected	325.2	Mean of Detected	4.93
SD of Detected	818.6	SD of Detected	1.177
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.35	Lilliefors Test Statistic	0.0853
5% Lilliefors Critical Value	0.0548	5% Lilliefors Critical Value	0.0548
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	324	Mean	4.917
SD	817.3	SD	1.193
95% DL/2 (t) UCL	407.3	95% H-Stat (DL/2) UCL	329.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	319.8	Mean in Log Scale	4.917
SD	819.7	SD in Log Scale	1.191
95% MLE (t) UCL	403.3	Mean in Original Scale	324
95% MLE (Tiku) UCL	393.7	SD in Original Scale	817.3
		95% t UCL	407.3
		95% Percentile Bootstrap UCL	414.4
		95% BCA Bootstrap UCL	446.7
		95% H UCL	329.1
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.701	Data do not follow a Discernable Distribution (0.05)	
Theta Star	464.1		
nu star	365.7		
A-D Test Statistic	12.65	Nonparametric Statistics	
5% A-D Critical Value	0.801	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.801	Mean	324
5% K-S Critical Value	0.0591	SD	815.7
Data not Gamma Distributed at 5% Significance Level		SE of Mean	50.49
		95% KM (t) UCL	407.3
Assuming Gamma Distribution		95% KM (z) UCL	407
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	407.3
Minimum	1.00E-06	95% KM (bootstrap t) UCL	485.9
Maximum	8790	95% KM (BCA) UCL	407
Mean	323.9	95% KM (Percentile Bootstrap) UCL	414.2
Median	120.5	95% KM (Chebyshev) UCL	544.1
SD	817.3	97.5% KM (Chebyshev) UCL	639.3
k star	0.655	99% KM (Chebyshev) UCL	826.4
Theta star	494.2		
Nu star	343.5	Potential UCLs to Use	
AppChi2	301.5	95% KM (Chebyshev) UCL	544.1
95% Gamma Approximate UCL	369		
95% Adjusted Gamma UCL	369.3		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	23
Number of Distinct Detected Data	19	Number of Non-Detect Data	239
		Percent Non-Detects	91.22%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.037	Minimum Detected	-3.297
Maximum Detected	16.8	Maximum Detected	2.821
Mean of Detected	1.261	Mean of Detected	-1.515
SD of Detected	3.526	SD of Detected	1.763
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	2	Maximum Non-Detect	0.693
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	260
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	99.24%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.373	Shapiro Wilk Test Statistic	0.873
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.569	Mean	-0.763
SD	1.046	SD	0.565
95% DL/2 (t) UCL	0.675	95% H-Stat (DL/2) UCL	0.583
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.36
		SD in Log Scale	1.266
		Mean in Original Scale	0.258
		SD in Original Scale	1.085
		95% t UCL	0.368
		95% Percentile Bootstrap UCL	0.377
		95% BCA Bootstrap UCL	0.523
		95% H-UCL	0.253
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.359	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.509		
nu star	16.53		
A-D Test Statistic	2.078	Nonparametric Statistics	
5% A-D Critical Value	0.831	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.831	Mean	0.23
5% K-S Critical Value	0.195	SD	1.078
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0757
		95% KM (t) UCL	0.355
Assuming Gamma Distribution		95% KM (z) UCL	0.355
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.354
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.512
Maximum	16.8	95% KM (BCA) UCL	0.384
Mean	0.679	95% KM (Percentile Bootstrap) UCL	0.366
Median	0.044	95% KM (Chebyshev) UCL	0.56
SD	1.348	97.5% KM (Chebyshev) UCL	0.703
k star	0.128	99% KM (Chebyshev) UCL	0.983
Theta star	5.328		
Nu star	66.83	Potential UCLs to Use	
AppChi2	49.01	95% KM (Chebyshev) UCL	0.56
95% Gamma Approximate UCL	0.926		
95% Adjusted Gamma UCL	0.928		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chromium

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	97
Number of Distinct Detected Data	68	Number of Non-Detect Data	165
		Percent Non-Detects	62.98%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	96.8	Maximum Detected	4.573
Mean of Detected	2.797	Mean of Detected	-0.416
SD of Detected	12.47	SD of Detected	1.22
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	4	Maximum Non-Detect	1.386
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	256
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.71%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.415	Lilliefors Test Statistic	0.142
5% Lilliefors Critical Value	0.09	5% Lilliefors Critical Value	0.09
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.669	Mean	-0.151
SD	7.613	SD	0.769
95% DL/2 (t) UCL	2.445	95% H-Stat (DL/2) UCL	1.268
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.641
		SD in Log Scale	1.043
		Mean in Original Scale	1.451
		SD in Original Scale	7.646
		95% t UCL	2.231
		95% Percentile Bootstrap UCL	2.262
		95% BCA Bootstrap UCL	2.764
		95% H-UCL	1.043
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.441	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.348		
nu star	85.47		
A-D Test Statistic	12.58	Nonparametric Statistics	
5% A-D Critical Value	0.831	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.831	Mean	1.397
5% K-S Critical Value	0.0968	SD	7.633
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.475
		95% KM (t) UCL	2.181
Assuming Gamma Distribution		95% KM (z) UCL	2.179
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.179
Minimum	1.00E-06	95% KM (bootstrap t) UCL	6.54
Maximum	96.8	95% KM (BCA) UCL	2.259
Mean	2.305	95% KM (Percentile Bootstrap) UCL	2.304
Median	0.523	95% KM (Chebyshev) UCL	3.469
SD	7.861	97.5% KM (Chebyshev) UCL	4.366
k star	0.163	99% KM (Chebyshev) UCL	6.127
Theta star	14.15		
Nu star	85.38	Potential UCLs to Use	
AppChi2	65.08	95% KM (BCA) UCL	2.259
95% Gamma Approximate UCL	3.024		
95% Adjusted Gamma UCL	3.029		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	72
Number of Distinct Detected Data	54	Number of Non-Detect Data	190
		Percent Non-Detects	72.52%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.053	Minimum Detected	-2.937
Maximum Detected	6.6	Maximum Detected	1.887
Mean of Detected	0.558	Mean of Detected	-1.403
SD of Detected	1.072	SD of Detected	1.127
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	2	Maximum Non-Detect	0.693
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	257
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	98.09%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.319	Lilliefors Test Statistic	0.11
5% Lilliefors Critical Value	0.104	5% Lilliefors Critical Value	0.104
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.518	Mean	-0.886
SD	0.561	SD	0.67
95% DL/2 (t) UCL	0.575	95% H-Stat (DL/2) UCL	0.558
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.588
		SD in Log Scale	0.97
		Mean in Original Scale	0.353
		SD in Original Scale	0.609
		95% t UCL	0.415
		95% Percentile Bootstrap UCL	0.42
		95% BCA Bootstrap UCL	0.435
		95% H-UCL	0.371
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.712	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.783		
nu star	102.5		
A-D Test Statistic	5.091	Nonparametric Statistics	
5% A-D Critical Value	0.794	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.794	Mean	0.332
5% K-S Critical Value	0.109	SD	0.601
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.043
		95% KM (t) UCL	0.403
Assuming Gamma Distribution		95% KM (z) UCL	0.402
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.403
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.421
Maximum	6.6	95% KM (BCA) UCL	0.418
Mean	0.512	95% KM (Percentile Bootstrap) UCL	0.407
Median	0.277	95% KM (Chebyshev) UCL	0.519
SD	0.703	97.5% KM (Chebyshev) UCL	0.601
k star	0.23	99% KM (Chebyshev) UCL	0.76
Theta star	2.231		
Nu star	120.3	Potential UCLs to Use	
AppChi2	95.99	95% KM (BCA) UCL	0.418
95% Gamma Approximate UCL	0.642		
95% Adjusted Gamma UCL	0.643		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Iron

General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	83
Number of Distinct Detected Data	83	Number of Non-Detect Data	179
		Percent Non-Detects	68.32%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	11	Minimum Detected	2.398
Maximum Detected	8520	Maximum Detected	9.05
Mean of Detected	750.6	Mean of Detected	5.307
SD of Detected	1632	SD of Detected	1.601
Minimum Non-Detect	100	Minimum Non-Detect	4.605
Maximum Non-Detect	200	Maximum Non-Detect	5.298
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	222
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	40
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	84.73%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.325	Lilliefors Test Statistic	0.119
5% Lilliefors Critical Value	0.0973	5% Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	272.1	Mean	4.357
SD	971.2	SD	1.108
95% DL/2 (t) UCL	371.2	95% H-Stat (DL/2) UCL	167.9
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	4.316
		SD in Log Scale	1.447
		Mean in Original Scale	290.2
		SD in Original Scale	968.7
		95% t UCL	389
		95% Percentile Bootstrap UCL	396.3
		95% BCA Bootstrap UCL	435.5
		95% H-UCL	267.8
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.476	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1576		
nu star	79.05		
A-D Test Statistic	3.833	Nonparametric Statistics	
5% A-D Critical Value	0.822	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.822	Mean	274.7
5% K-S Critical Value	0.104	SD	968.9
Data not Gamma Distributed at 5% Significance Level		SE of Mean	60.3
		95% KM (t) UCL	374.2
Assuming Gamma Distribution		95% KM (z) UCL	373.9
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	373.8
Minimum	1.00E-06	95% KM (bootstrap t) UCL	435.6
Maximum	8520	95% KM (BCA) UCL	387.1
Mean	355.7	95% KM (Percentile Bootstrap) UCL	383.8
Median	51.14	95% KM (Chebyshev) UCL	537.5
SD	981.3	97.5% KM (Chebyshev) UCL	651.3
k star	0.0977	99% KM (Chebyshev) UCL	874.7
Theta star	3640		
Nu star	51.2	Potential UCLs to Use	
AppChi2	35.76	95% KM (Chebyshev) UCL	537.5
95% Gamma Approximate UCL	509.1		
95% Adjusted Gamma UCL	510.2		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Manganese

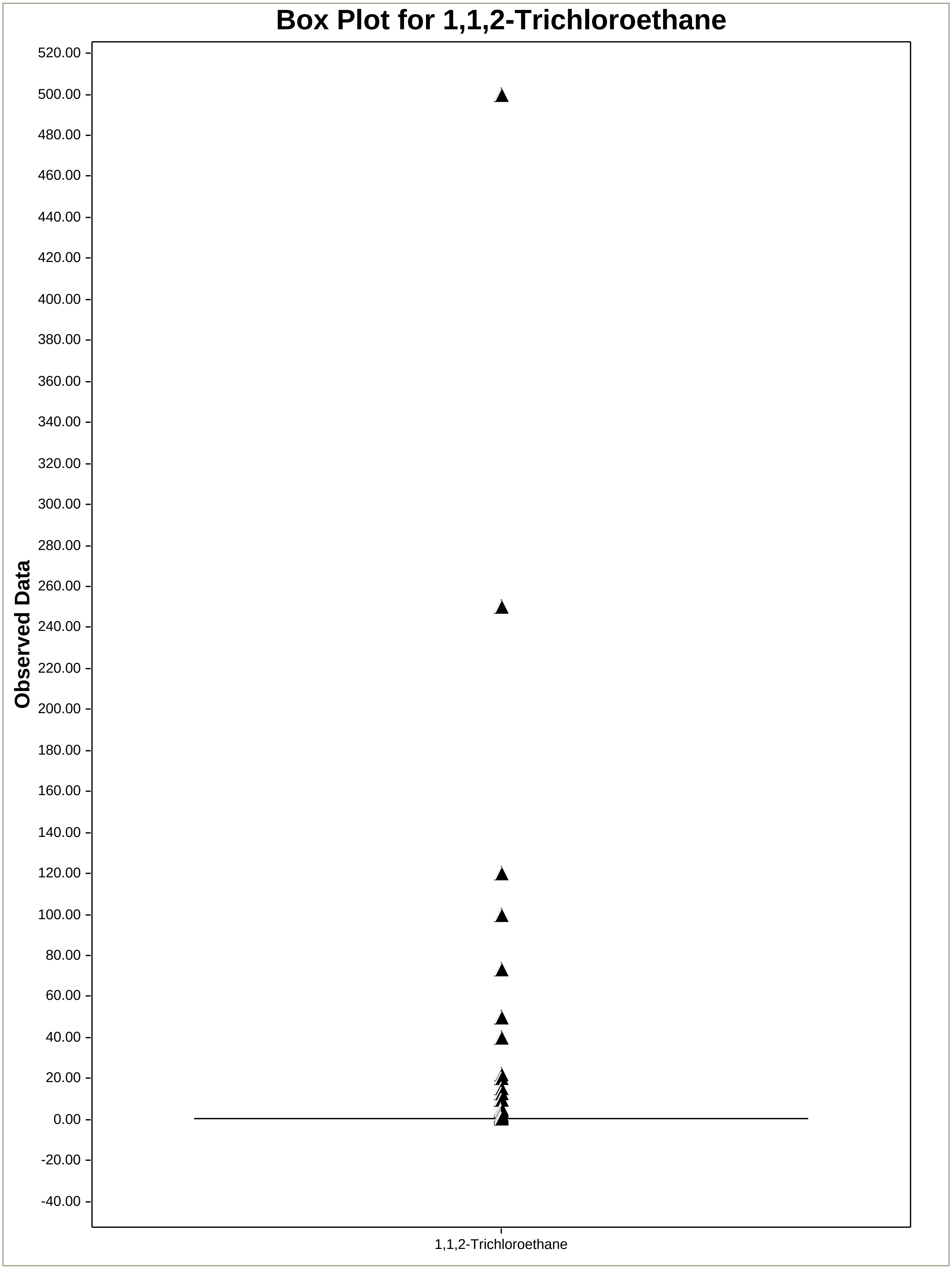
General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	245
Number of Distinct Detected Data	225	Number of Non-Detect Data	17
		Percent Non-Detects	6.49%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.18	Minimum Detected	-1.715
Maximum Detected	2020	Maximum Detected	7.611
Mean of Detected	205.6	Mean of Detected	3.866
SD of Detected	334.7	SD of Detected	2.063
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.27	Lilliefors Test Statistic	0.0646
5% Lilliefors Critical Value	0.0566	5% Lilliefors Critical Value	0.0566
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	192.3	Mean	3.57
SD	327.5	SD	2.291
95% DL/2 (t) UCL	225.7	95% H-Stat (DL/2) UCL	798
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	167.8	Mean in Log Scale	3.601
SD	353.4	SD in Log Scale	2.244
95% MLE (t) UCL	203.9	Mean in Original Scale	192.3
95% MLE (Tiku) UCL	201.7	SD in Original Scale	327.5
		95% t UCL	225.7
		95% Percentile Bootstrap UCL	226.3
		95% BCA Bootstrap UCL	228.2
		95% H UCL	728.5
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.441	Data do not follow a Discernable Distribution (0.05)	
Theta Star	466.5		
nu star	215.9		
A-D Test Statistic	2.183	Nonparametric Statistics	
5% A-D Critical Value	0.835	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.835	Mean	192.3
5% K-S Critical Value	0.0623	SD	326.9
Data not Gamma Distributed at 5% Significance Level		SE of Mean	20.24
		95% KM (t) UCL	225.7
Assuming Gamma Distribution		95% KM (z) UCL	225.6
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	225.7
Minimum	1.00E-06	95% KM (bootstrap t) UCL	230.3
Maximum	2020	95% KM (BCA) UCL	226.5
Mean	192.3	95% KM (Percentile Bootstrap) UCL	225.8
Median	50.2	95% KM (Chebyshev) UCL	280.5
SD	327.6	97.5% KM (Chebyshev) UCL	318.7
k star	0.275	99% KM (Chebyshev) UCL	393.7
Theta star	699.8		
Nu star	143.9	Potential UCLs to Use	
AppChi2	117.2	97.5% KM (Chebyshev) UCL	318.7
95% Gamma Approximate UCL	236.1		
95% Adjusted Gamma UCL	236.4		
Note: DL/2 is not a recommended method.			

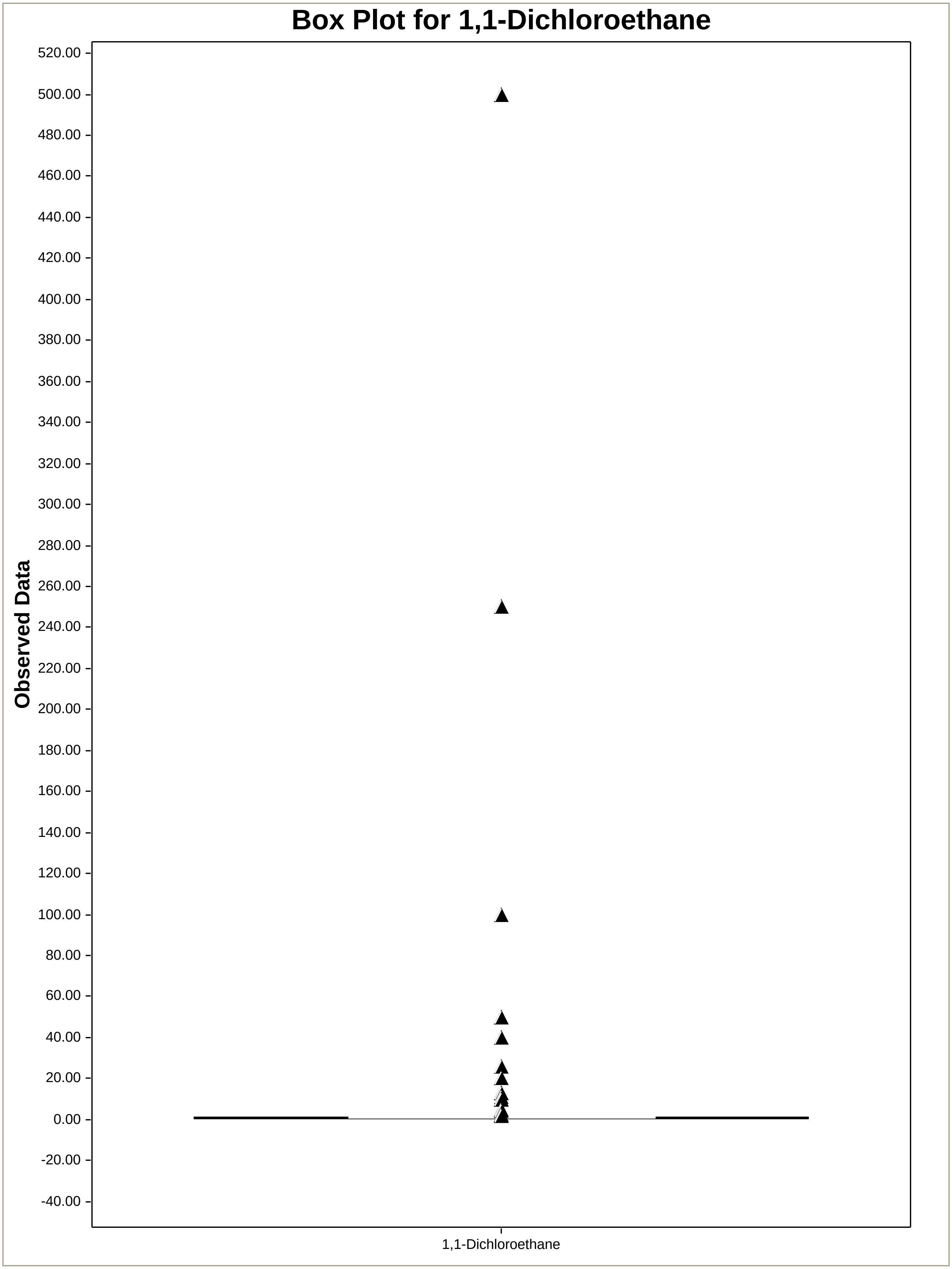
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Vanadium

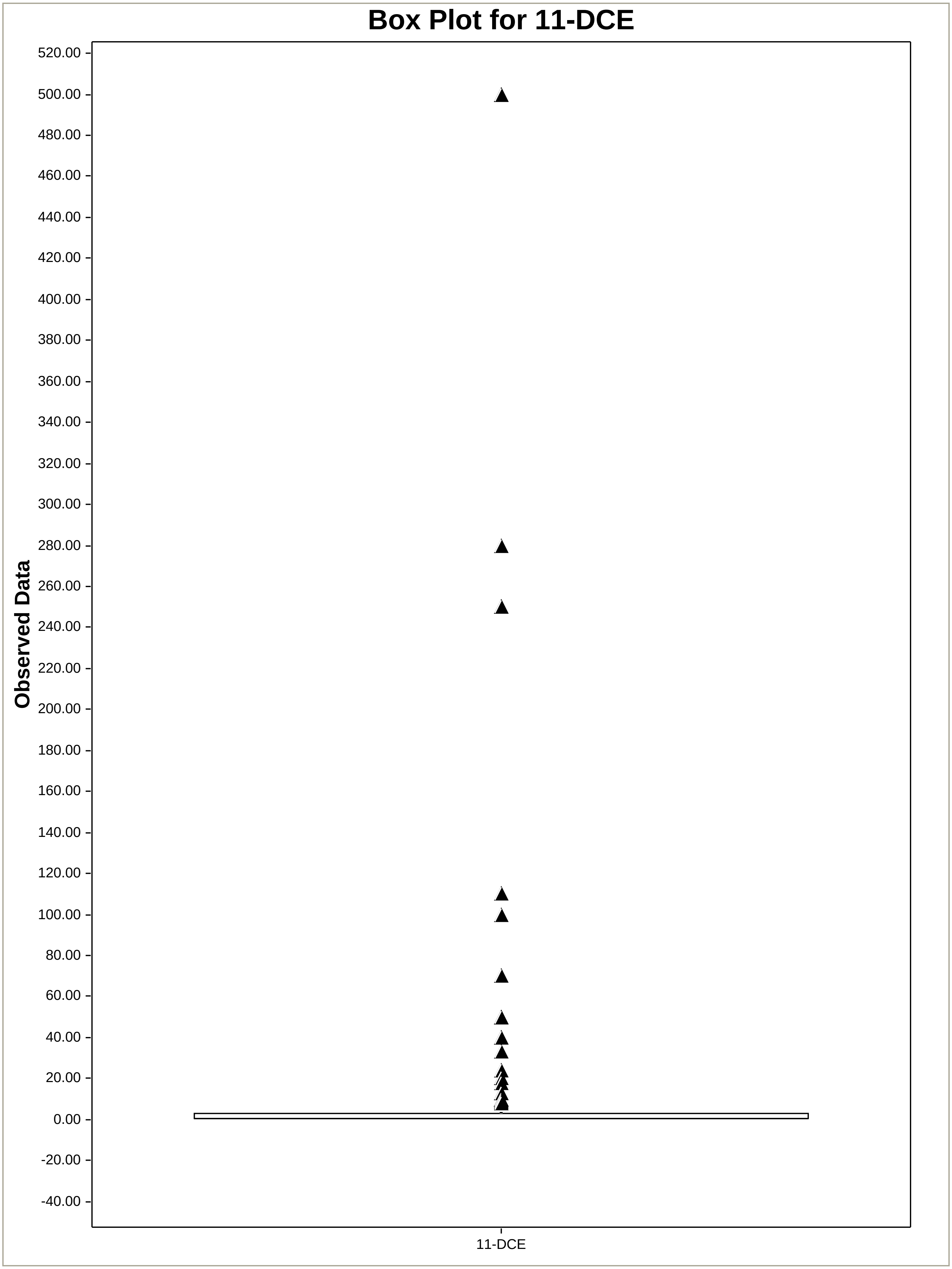
General Statistics - Data are in µg/L.			
Number of Valid Data	262	Number of Detected Data	216
Number of Distinct Detected Data	111	Number of Non-Detect Data	46
		Percent Non-Detects	17.56%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.3	Minimum Detected	0.262
Maximum Detected	30.1	Maximum Detected	3.405
Mean of Detected	7.848	Mean of Detected	1.921
SD of Detected	4.065	SD of Detected	0.559
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	205
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	57
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	78.24%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.0836	Lilliefors Test Statistic	0.0789
5% Lilliefors Critical Value	0.0603	5% Lilliefors Critical Value	0.0603
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.901	Mean	1.729
SD	4.23	SD	0.687
95% DL/2 (t) UCL	7.333	95% H-Stat (DL/2) UCL	7.737
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	5.174	Mean in Log Scale	1.779
SD	5.97	SD in Log Scale	0.612
95% MLE (t) UCL	5.782	Mean in Original Scale	7.037
95% MLE (Tiku) UCL	6.557	SD in Original Scale	4.109
		95% t UCL	7.456
		95% Percentile Bootstrap UCL	7.462
		95% BCA Bootstrap UCL	7.453
		95% H UCL	7.666
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.695	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.124		
nu star	1596		
A-D Test Statistic	0.592	Nonparametric Statistics	
5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.758	Mean	7.021
5% K-S Critical Value	0.0621	SD	4.128
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.259
		95% KM (t) UCL	7.448
Assuming Gamma Distribution		95% KM (z) UCL	7.446
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.447
Minimum	1.00E-06	95% KM (bootstrap t) UCL	7.469
Maximum	30.1	95% KM (BCA) UCL	7.429
Mean	6.941	95% KM (Percentile Bootstrap) UCL	7.466
Median	6.25	95% KM (Chebyshev) UCL	8.148
SD	4.276	97.5% KM (Chebyshev) UCL	8.636
k star	0.746	99% KM (Chebyshev) UCL	9.594
Theta star	9.307		
Nu star	390.8	Potential UCLs to Use	
AppChi2	346	95% KM (BCA) UCL	7.429
95% Gamma Approximate UCL	7.84		
95% Adjusted Gamma UCL	7.845		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

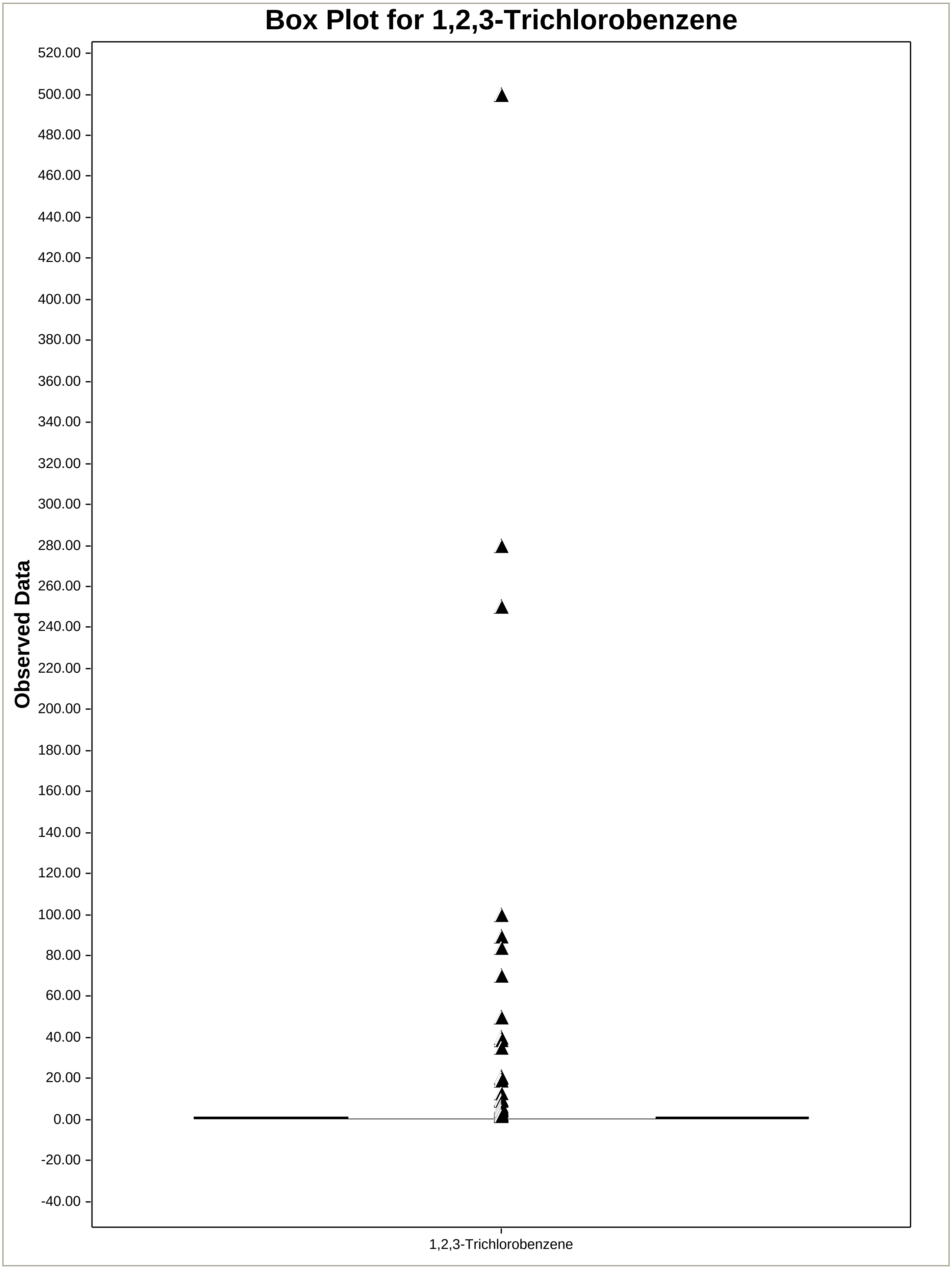

Box Plot for 1,1,2-Trichloroethane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,1,2-Trichloroethane



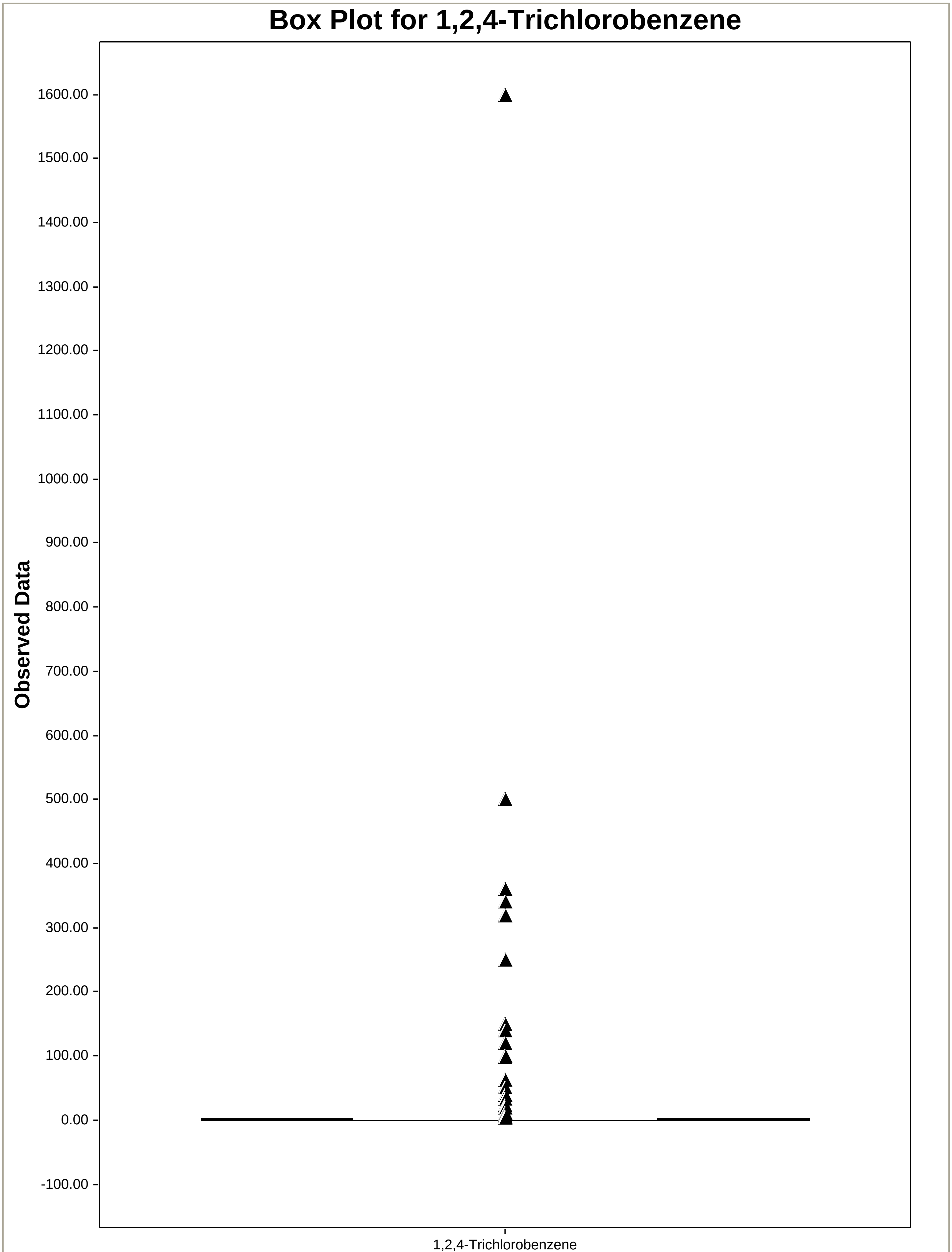
Box Plot for 1,1-Dichloroethane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,1-Dichloroethane

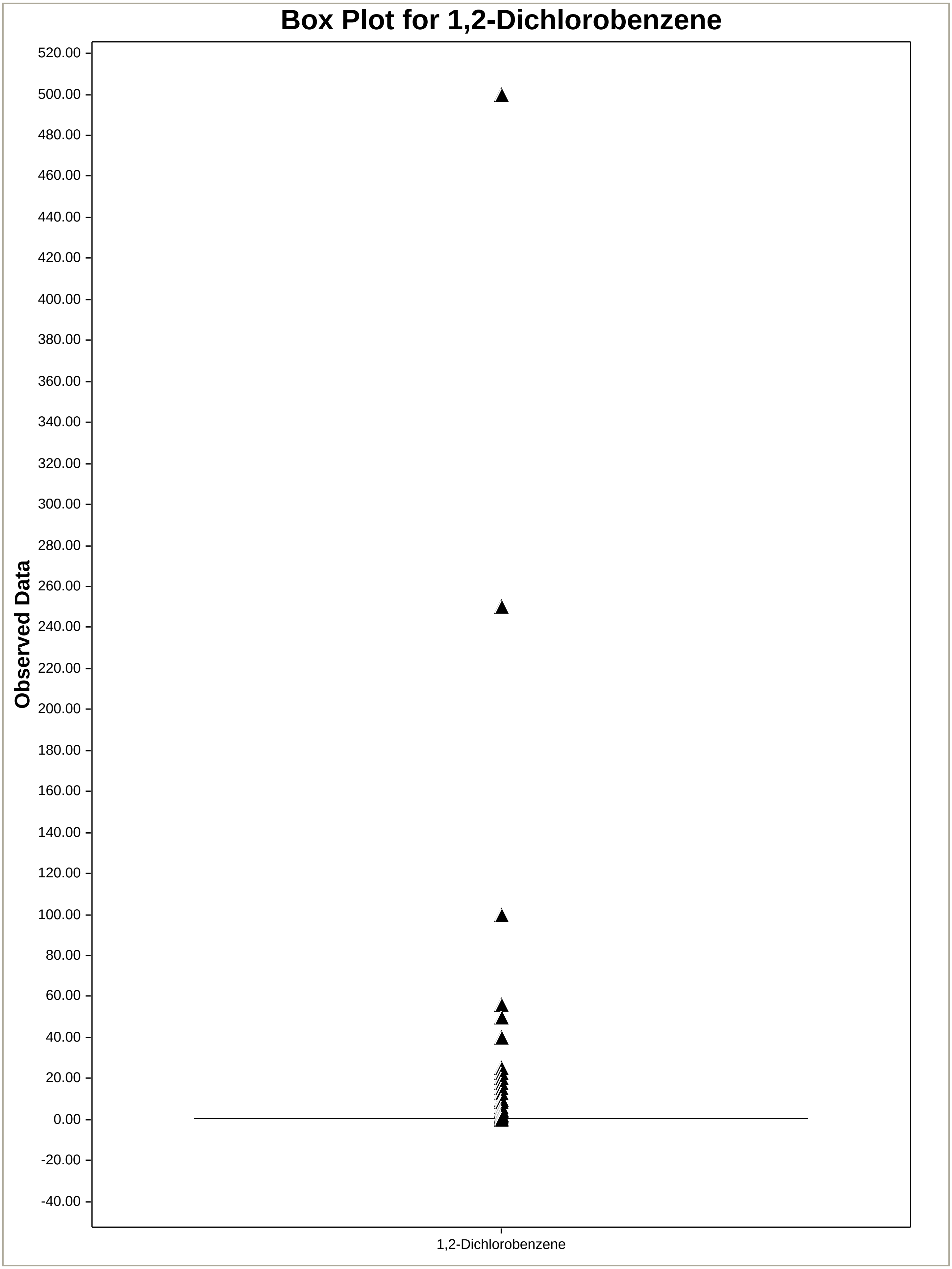


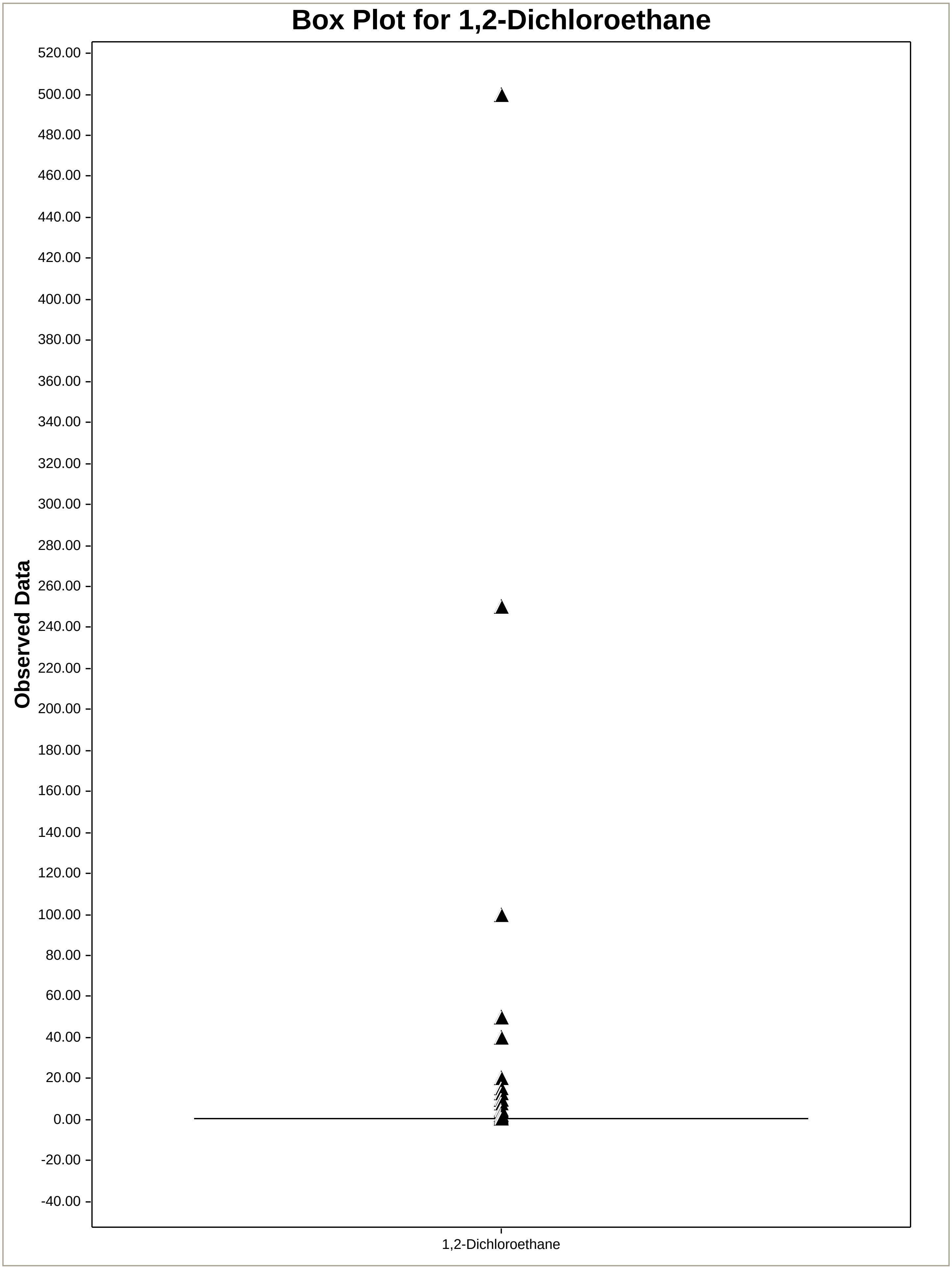
Box Plot for 11-DCE
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
11-DCE

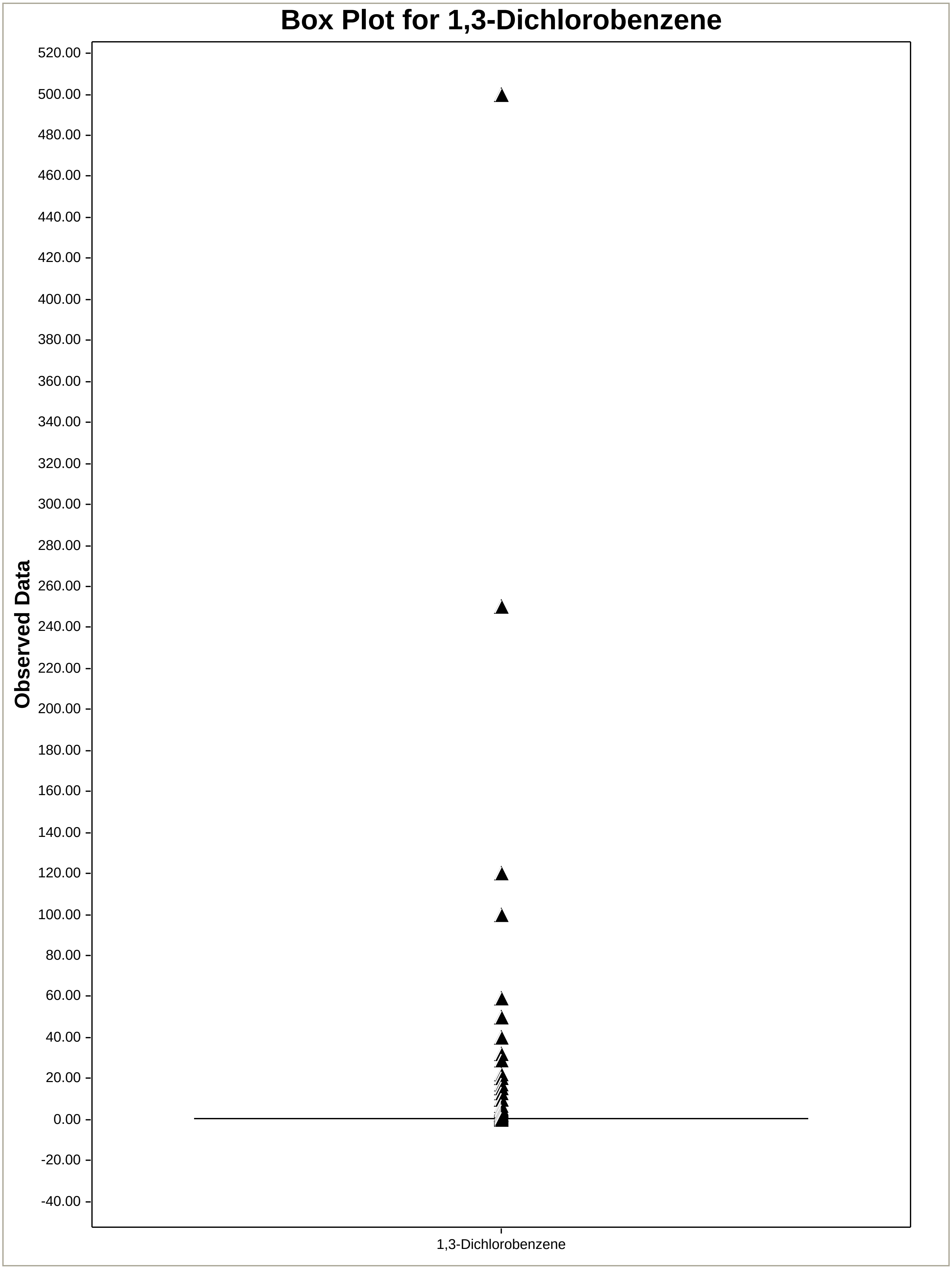


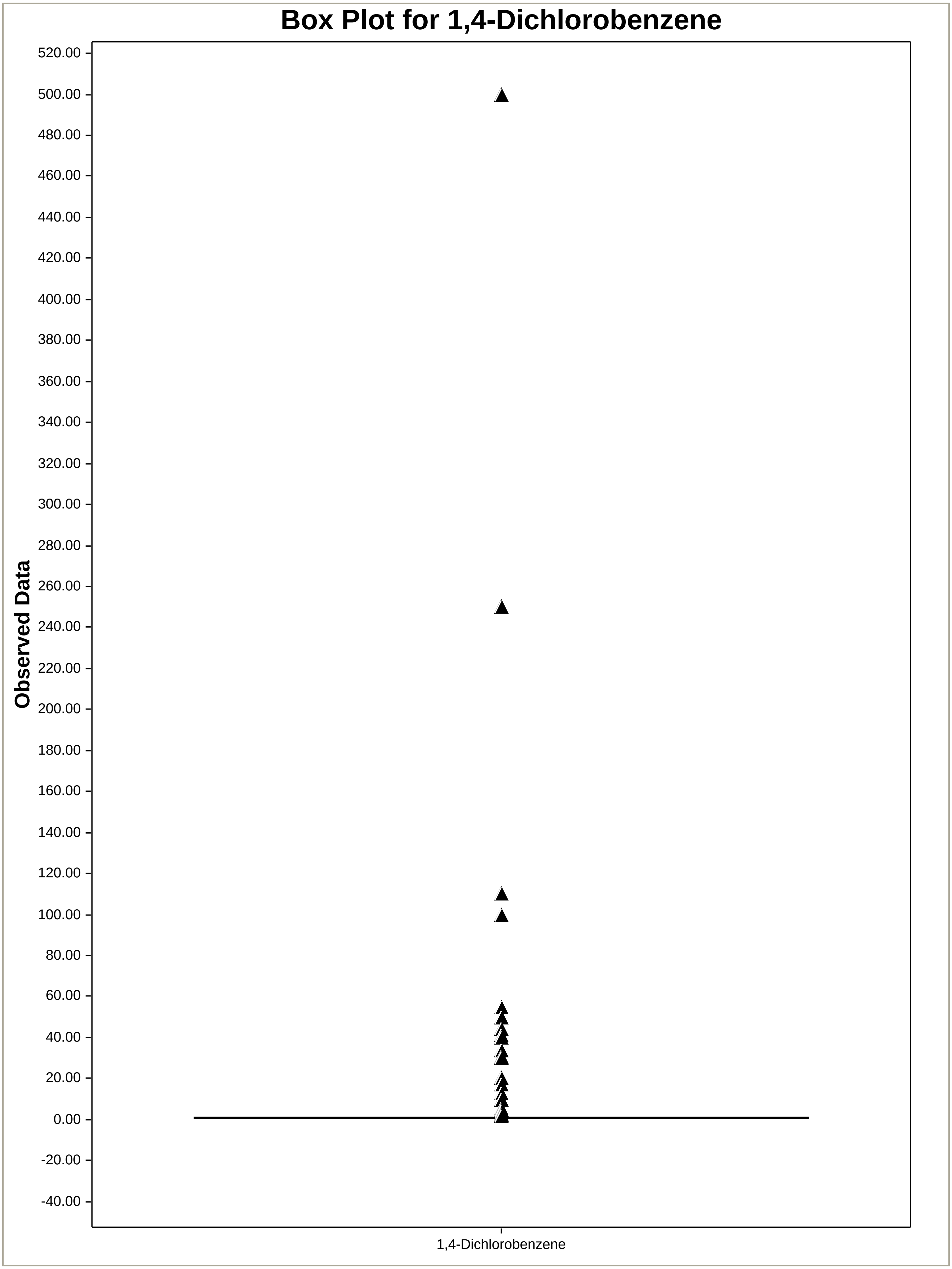
Box Plot for 1,2,3-Trichlorobenzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,2,3-Trichlorobenzene


Box Plot for 1,2,4-Trichlorobenzene
Observed Data
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
1,2,4-Trichlorobenzene

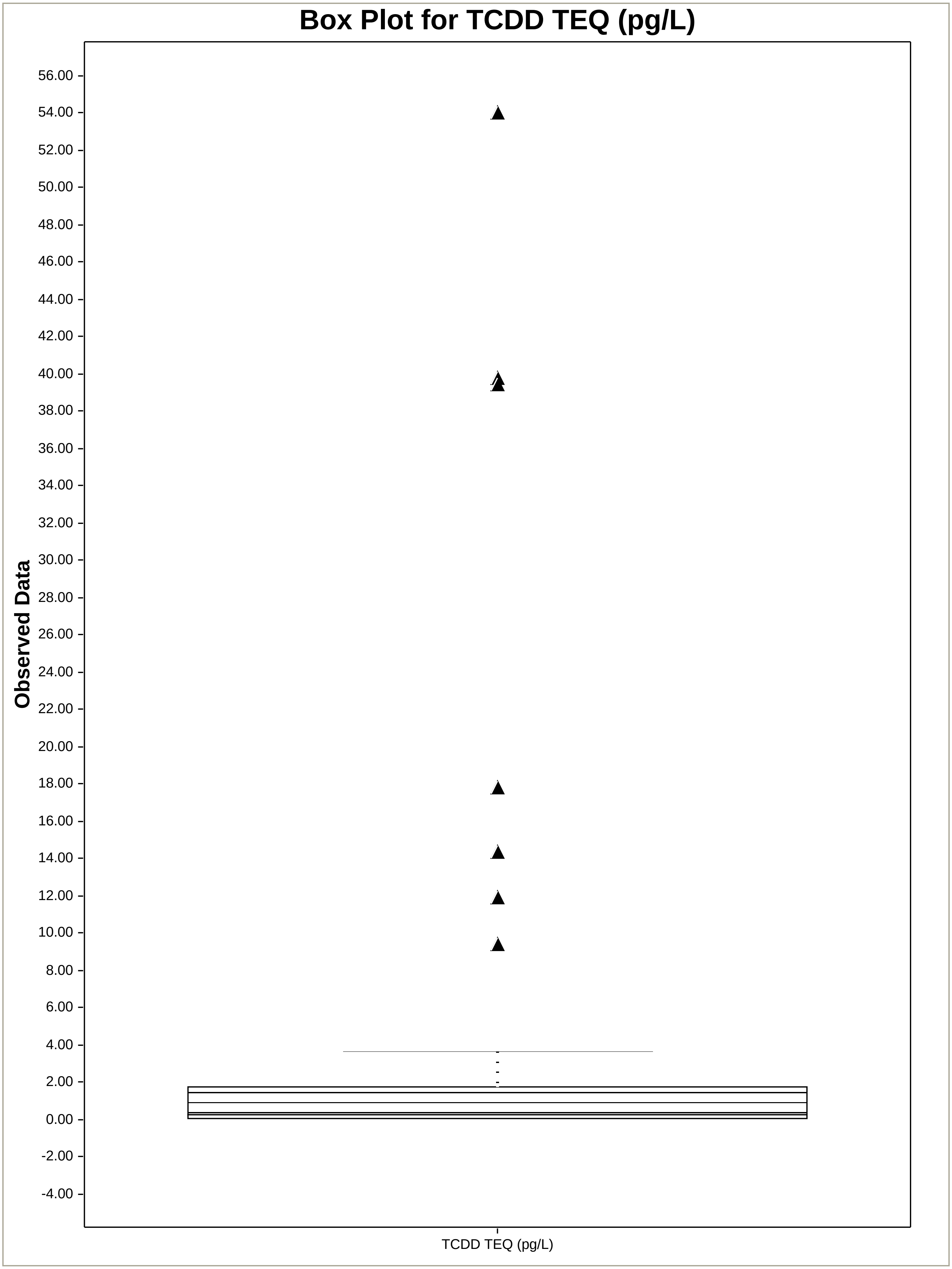

Box Plot for 1,2-Dichlorobenzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,2-Dichlorobenzene

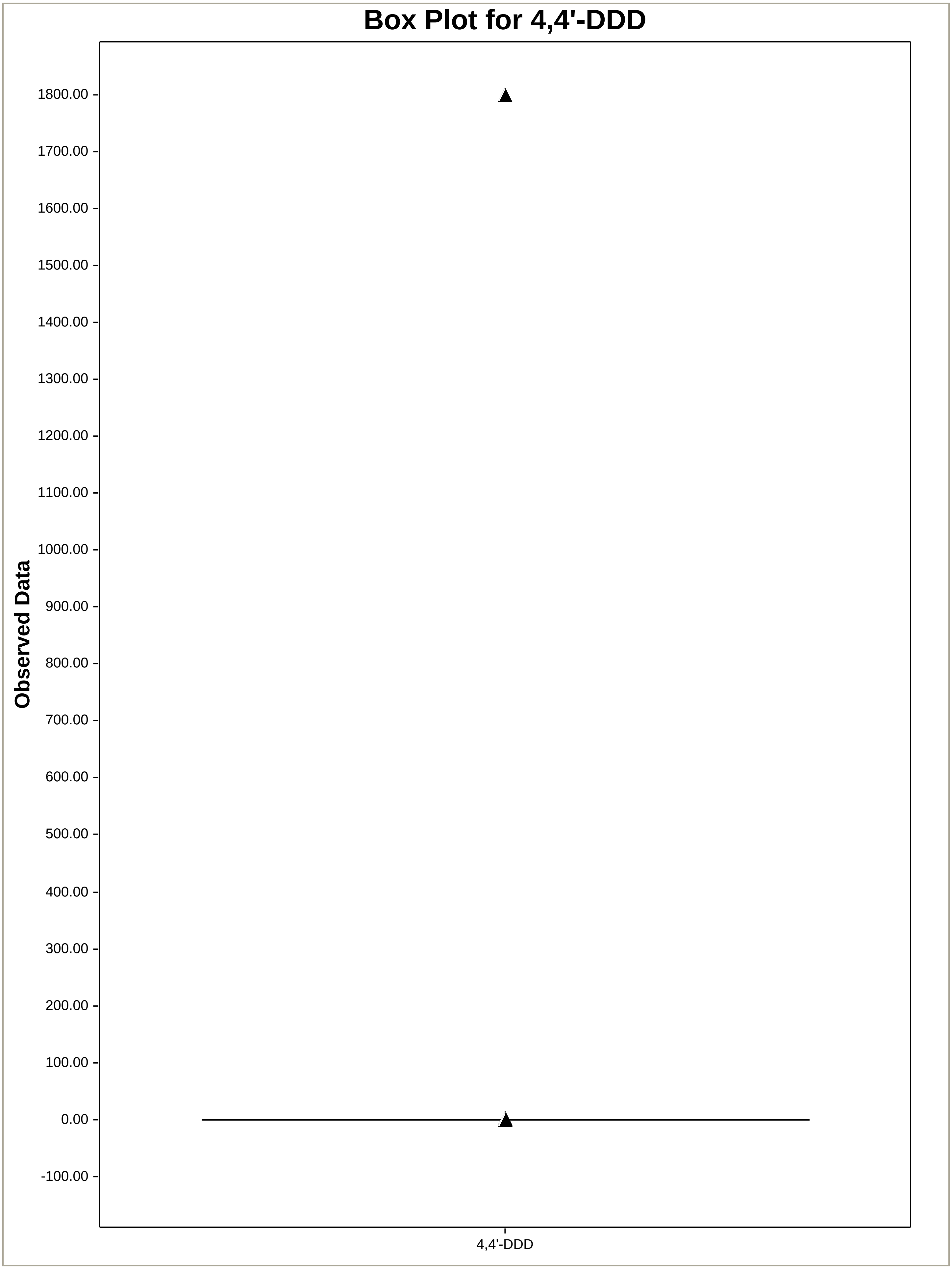

Box Plot for 1,2-Dichloroethane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,2-Dichloroethane

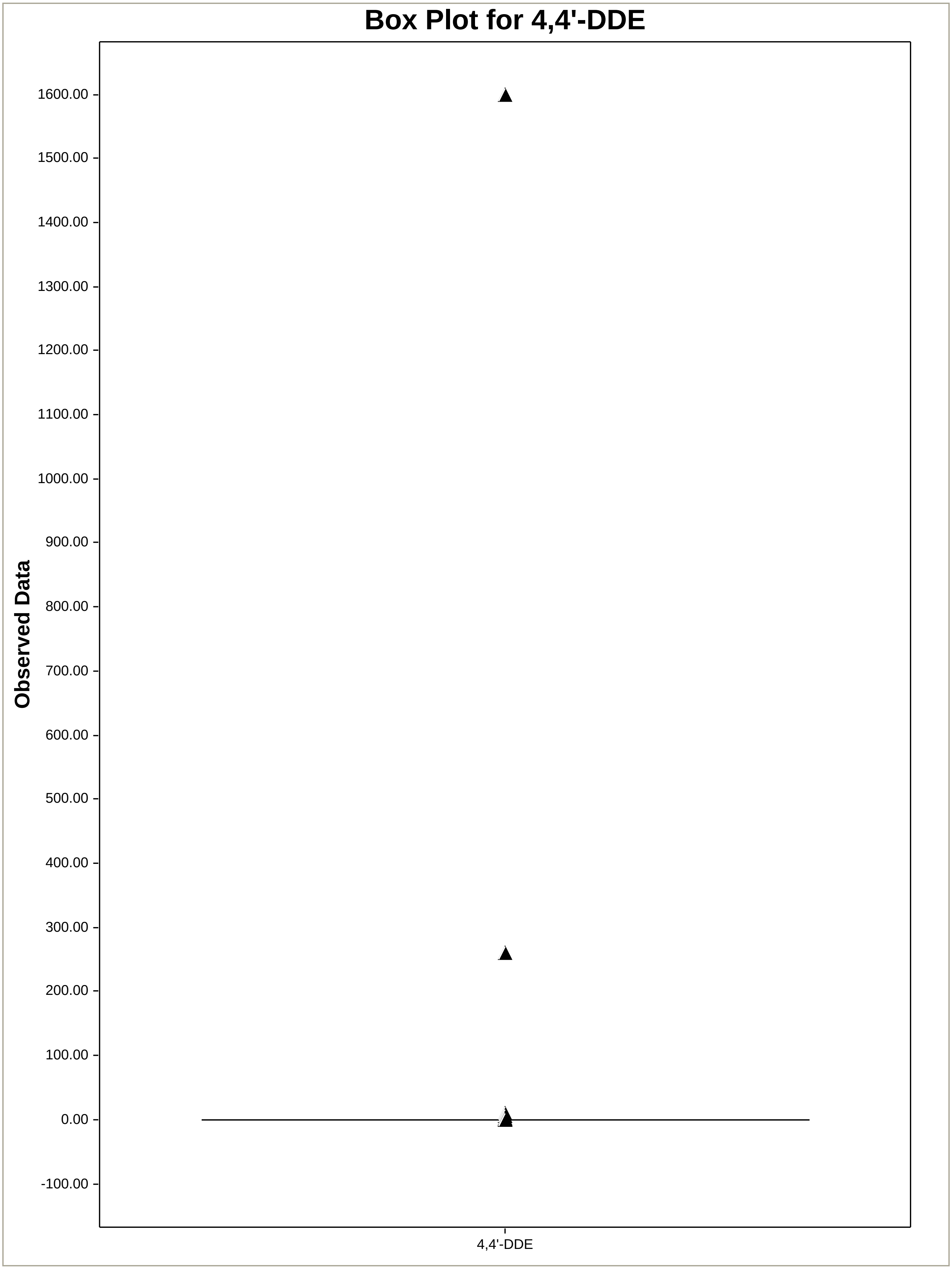

Box Plot for 1,3-Dichlorobenzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,3-Dichlorobenzene

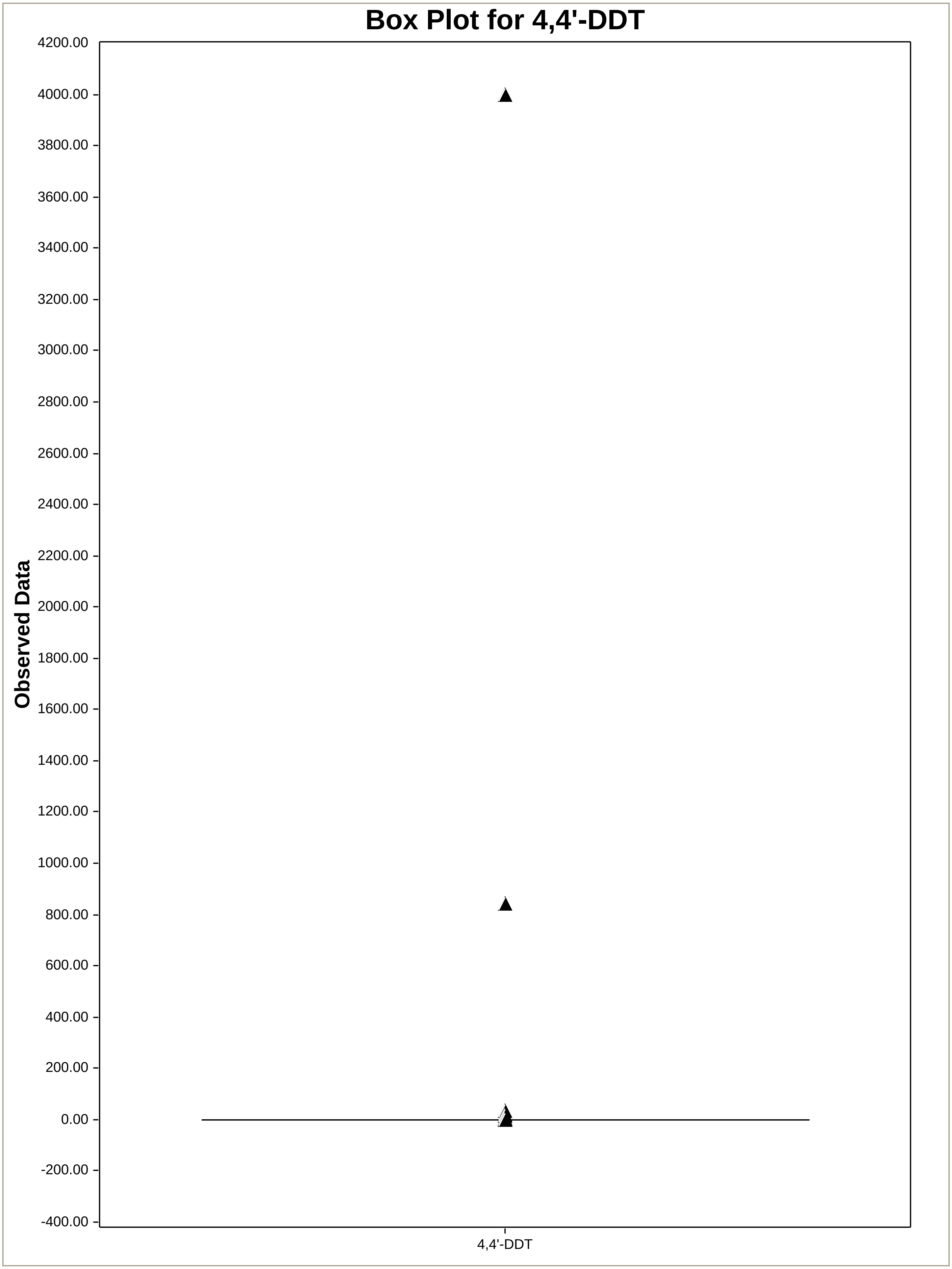


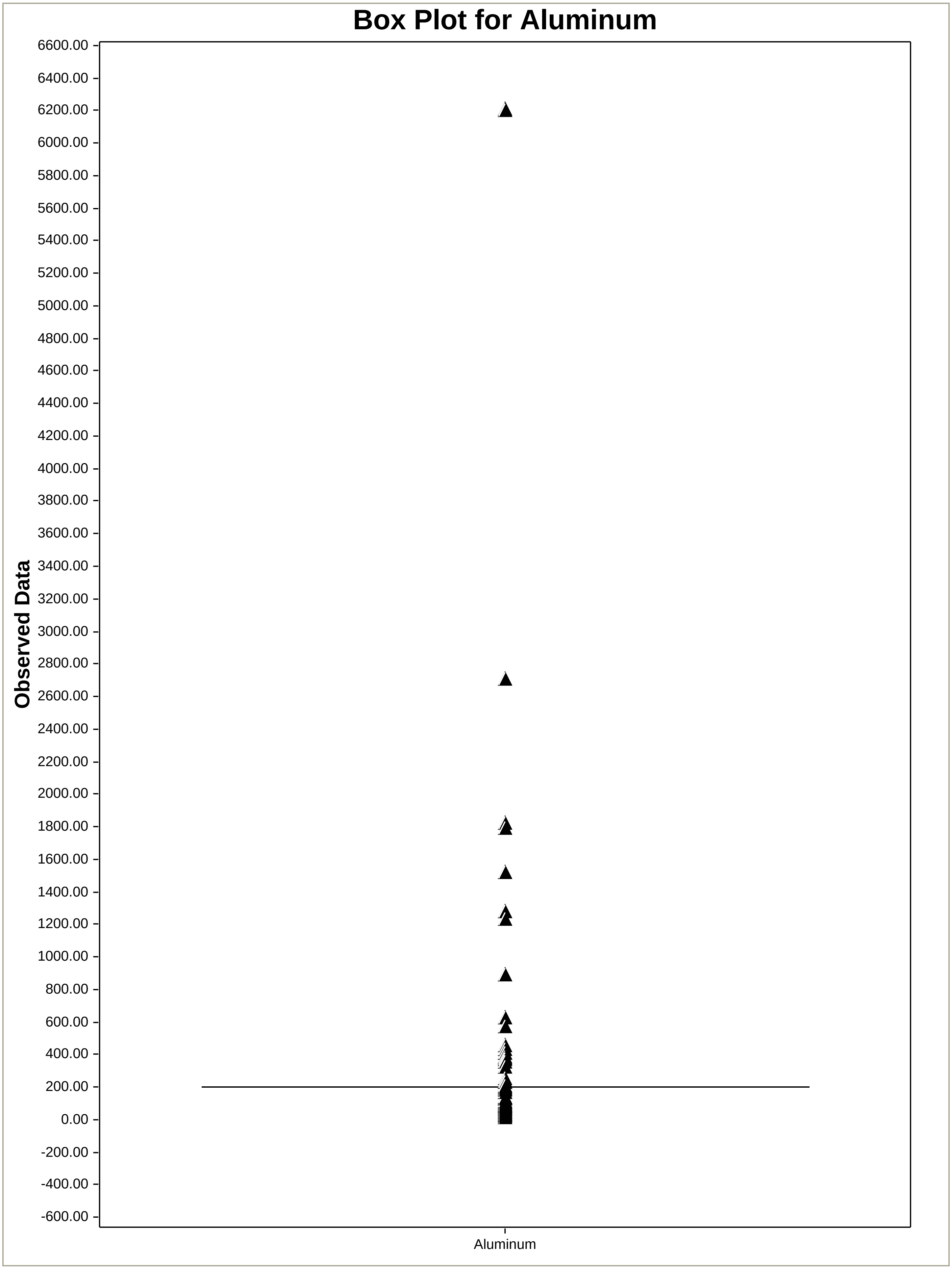
Box Plot for 1,4-Dichlorobenzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
1,4-Dichlorobenzene

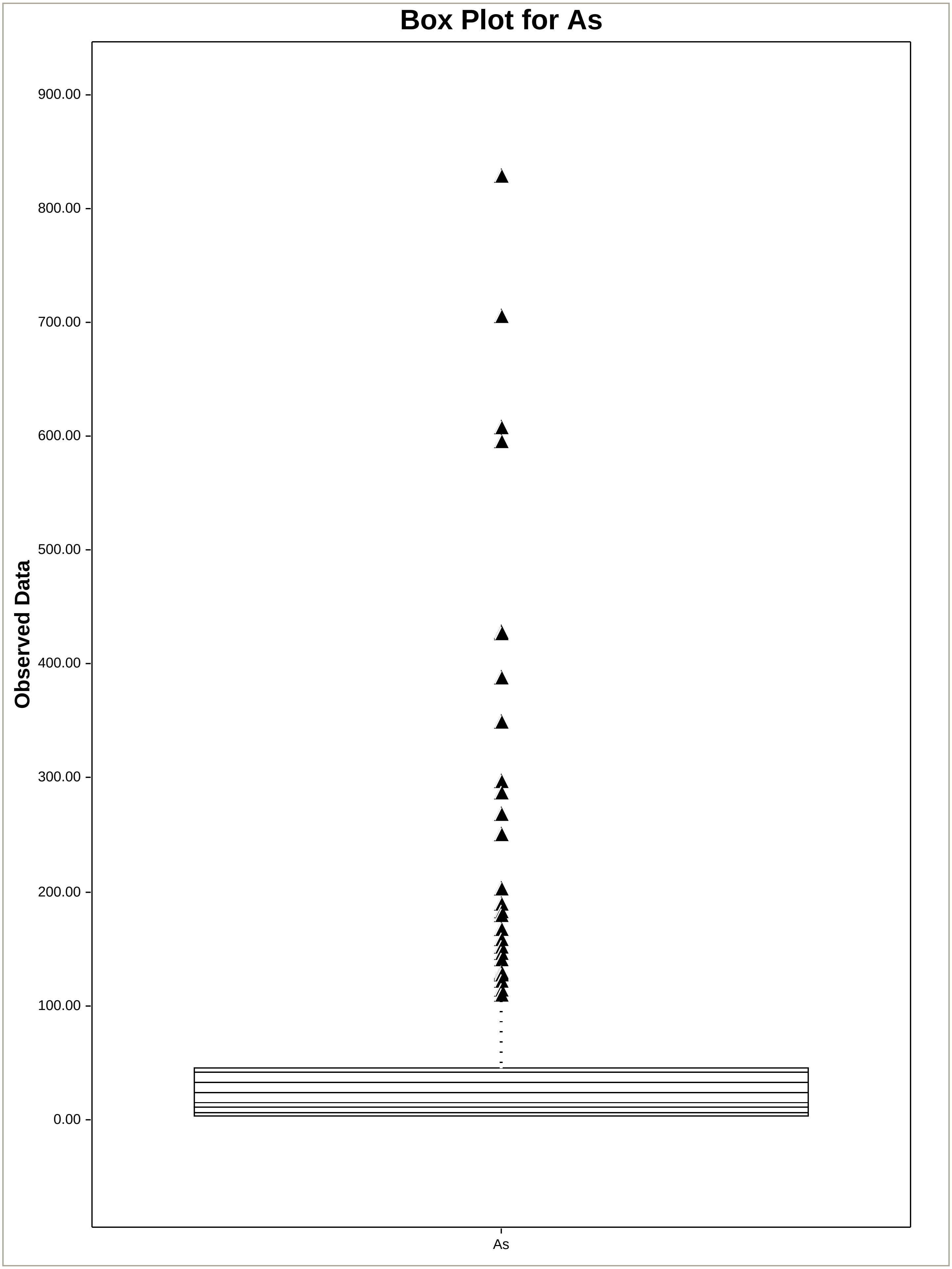

Box Plot for TCDD TEQ (pg/L)
Observed Data
56.00
54.00
52.00
50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
TCDD TEQ (pg/L)


Box Plot for 4,4'-DDD
Observed Data
1800.00
1700.00
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
4,4'-DDD

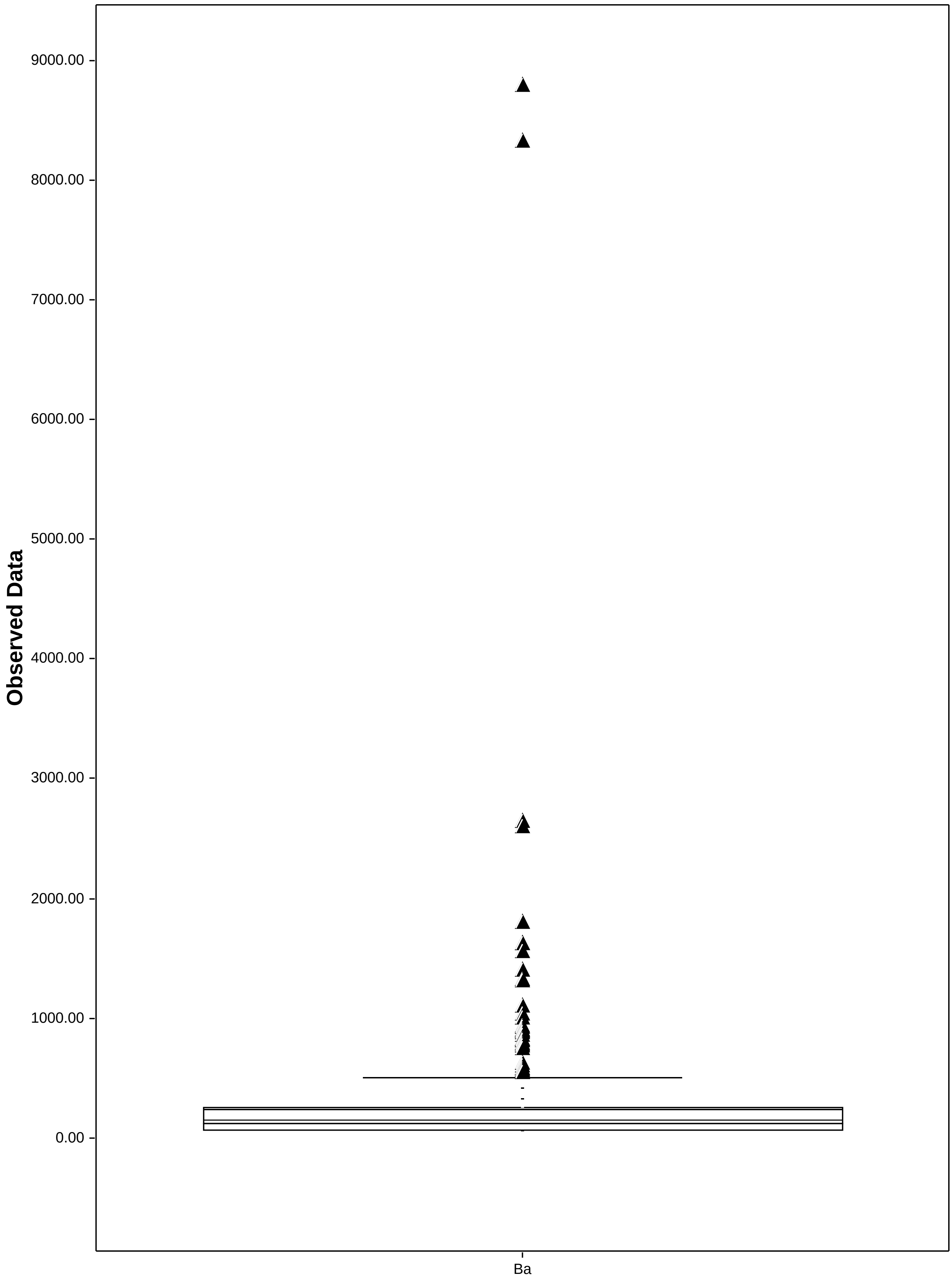

Box Plot for 4,4'-DDE
Observed Data
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
4,4'-DDE

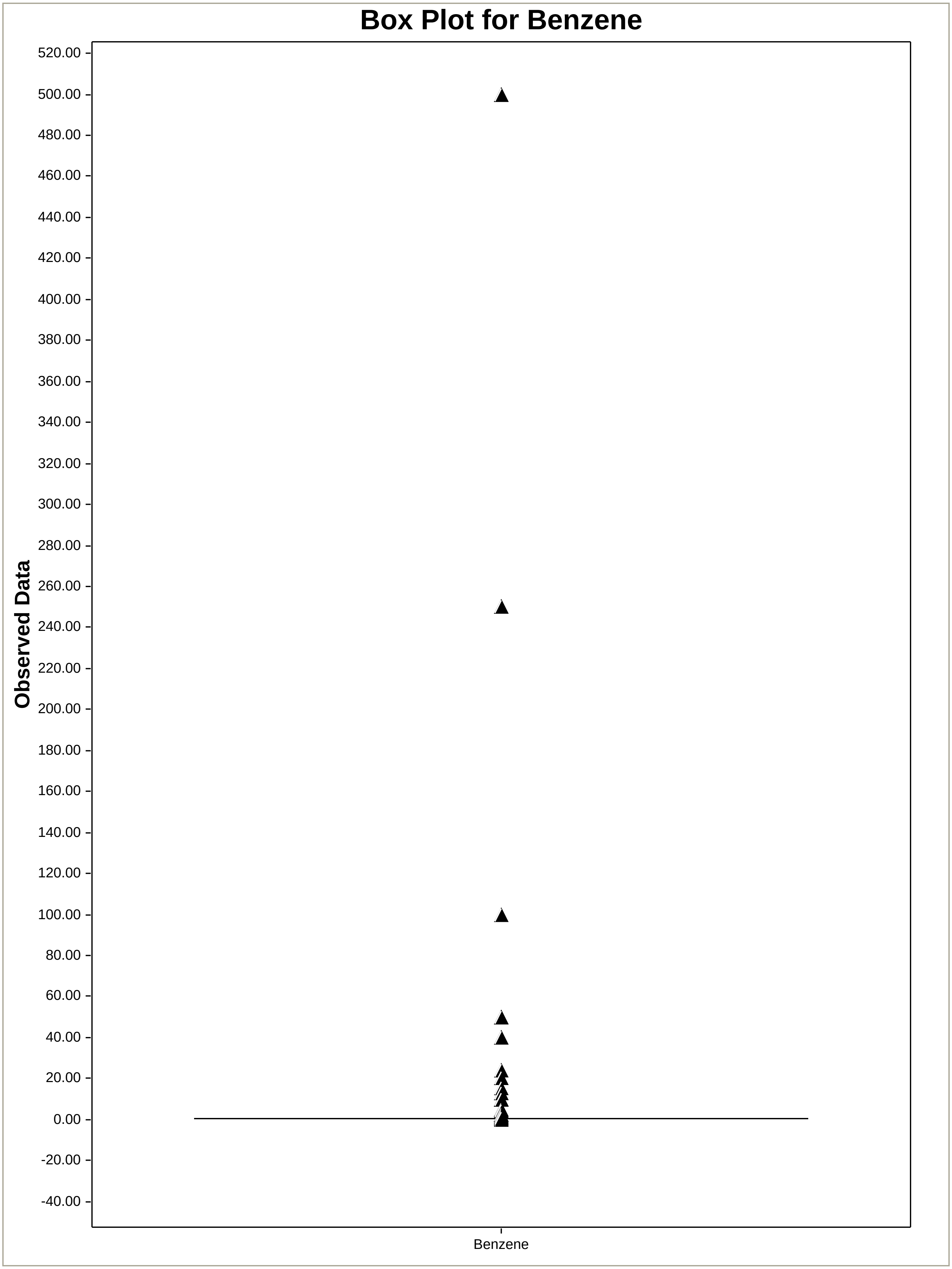

Box Plot for 4,4'-DDT
Observed Data
4200.00
4000.00
3800.00
3600.00
3400.00
3200.00
3000.00
2800.00
2600.00
2400.00
2200.00
2000.00
1800.00
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
-200.00
-400.00
4,4'-DDT

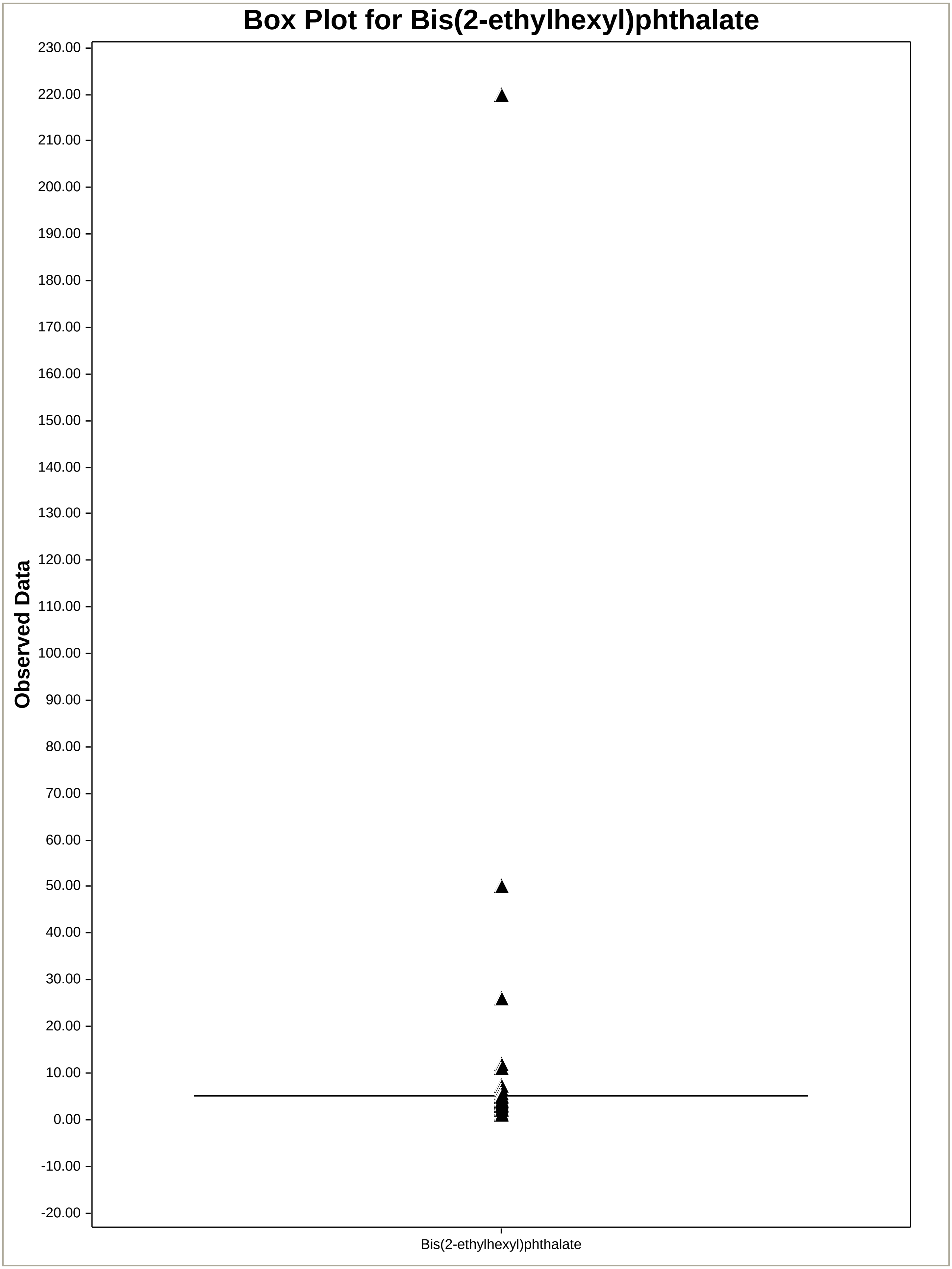

Box Plot for Aluminum
Observed Data
6600.00
6400.00
6200.00
6000.00
5800.00
5600.00
5400.00
5200.00
5000.00
4800.00
4600.00
4400.00
4200.00
4000.00
3800.00
3600.00
3400.00
3200.00
3000.00
2800.00
2600.00
2400.00
2200.00
2000.00
1800.00
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
-200.00
-400.00
-600.00
Aluminum

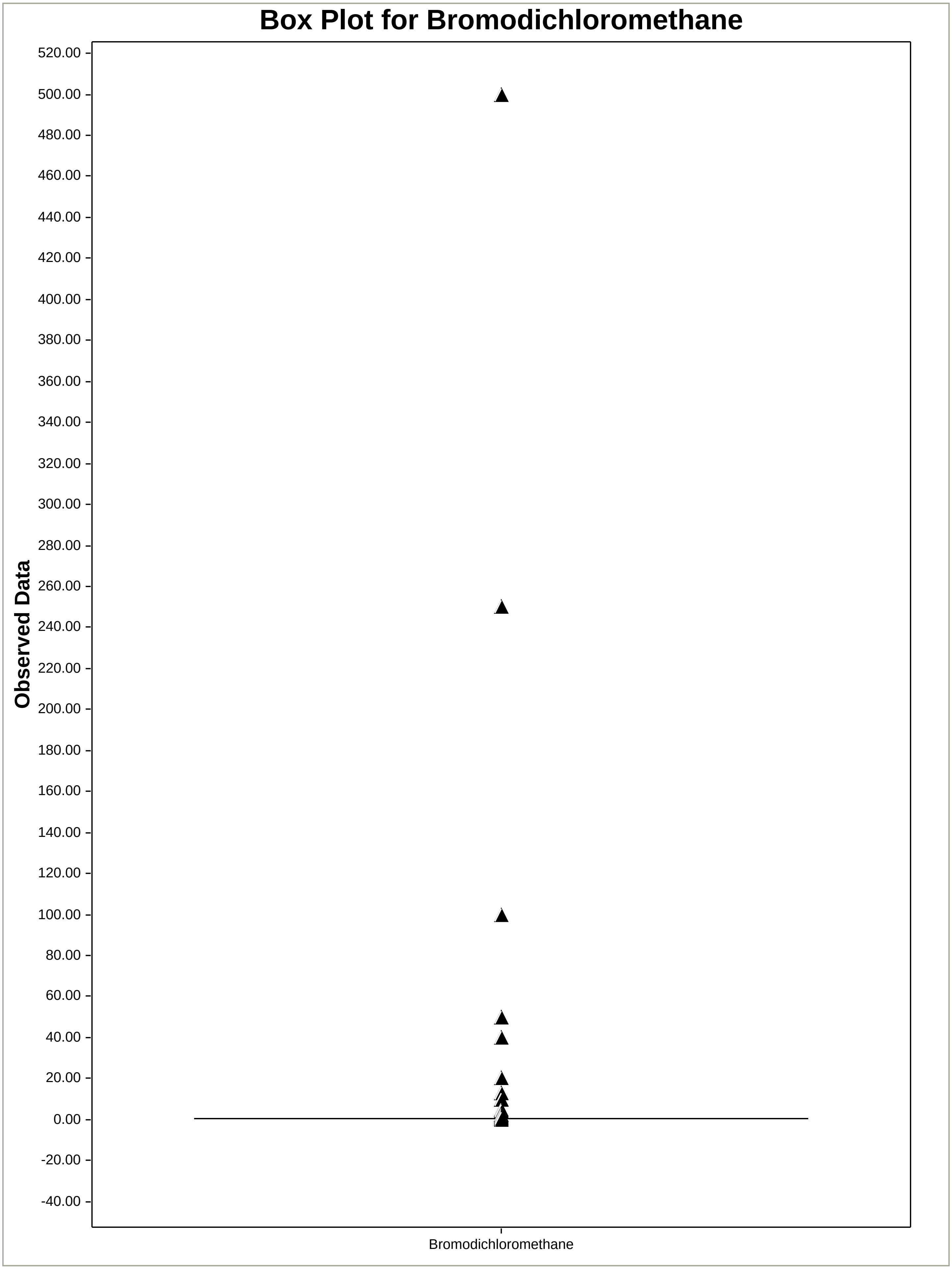

Box Plot for As
Observed Data
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
As

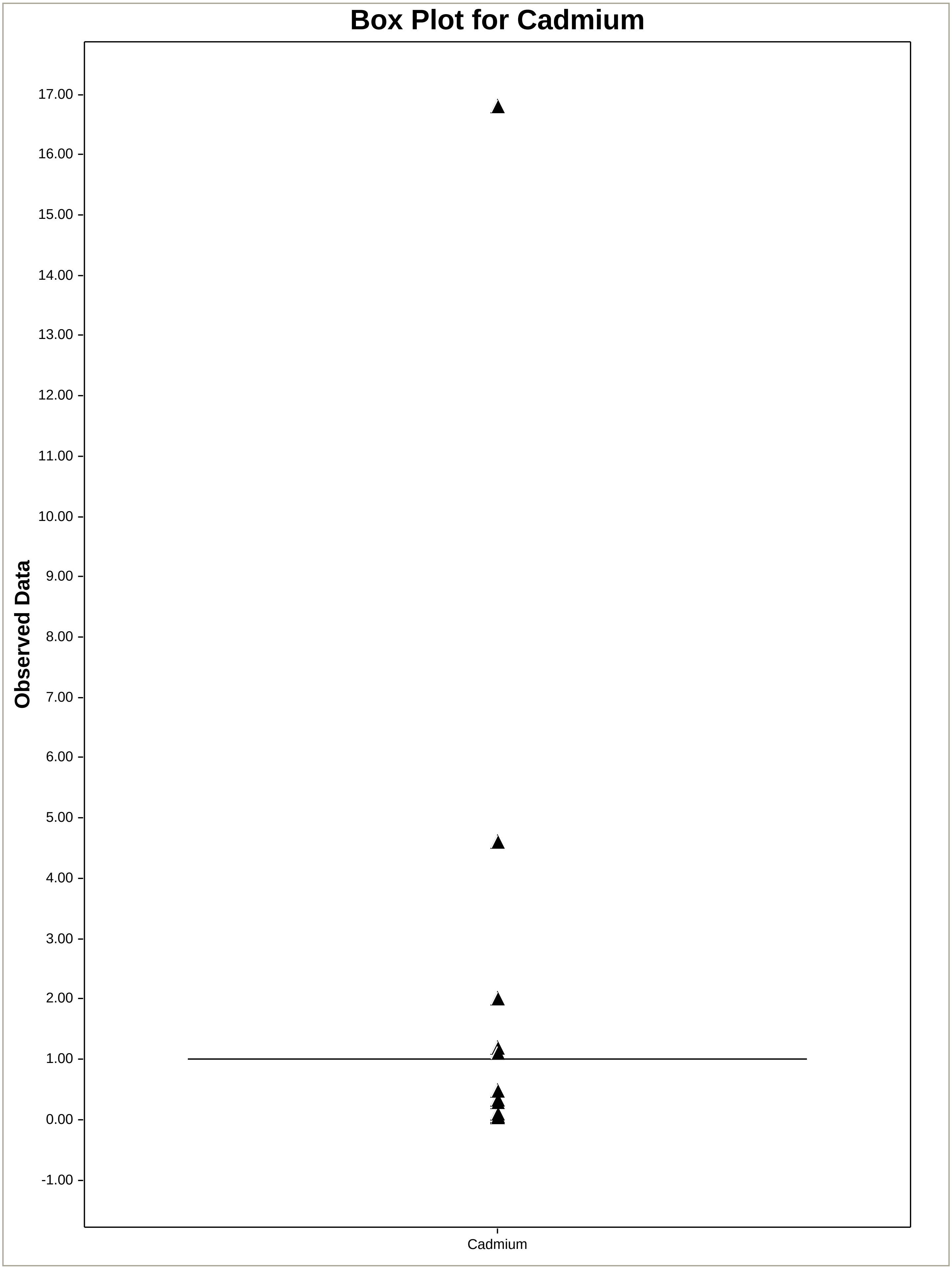
Box Plot for Ba

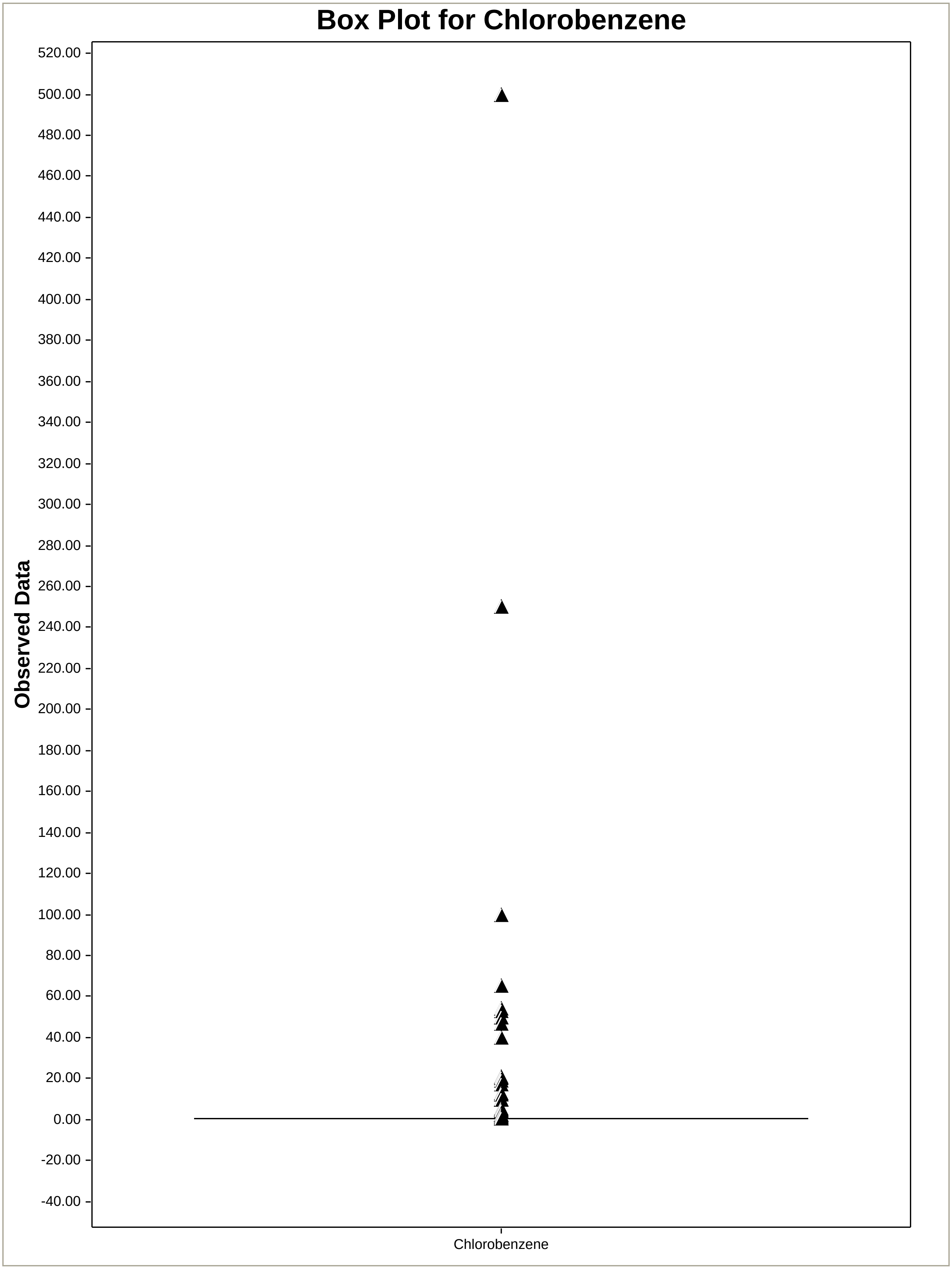



Box Plot for Benzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Benzene

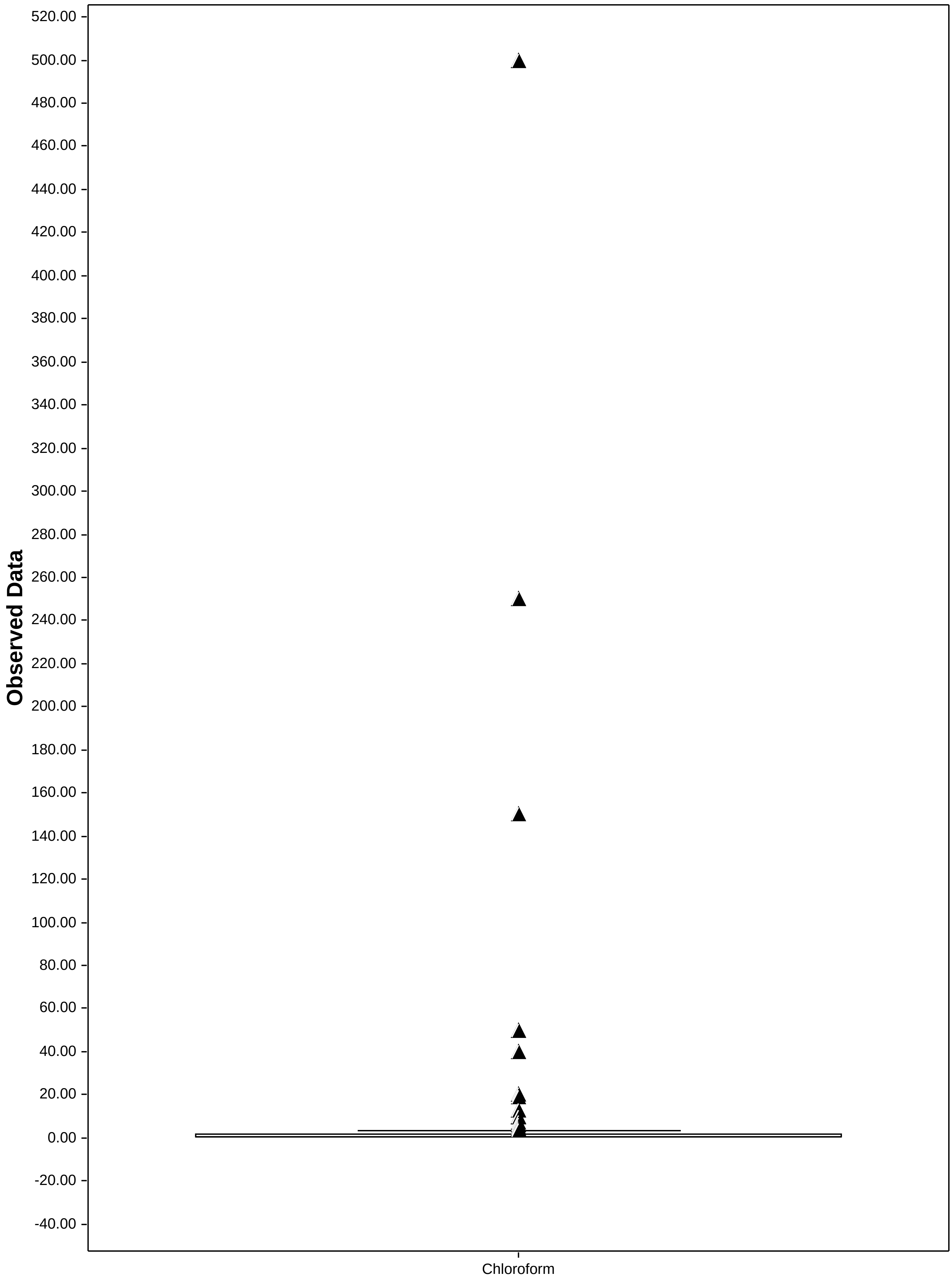

Box Plot for Bis(2-ethylhexyl)phthalate
Observed Data
230.00
220.00
210.00
200.00
190.00
180.00
170.00
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
Bis(2-ethylhexyl)phthalate

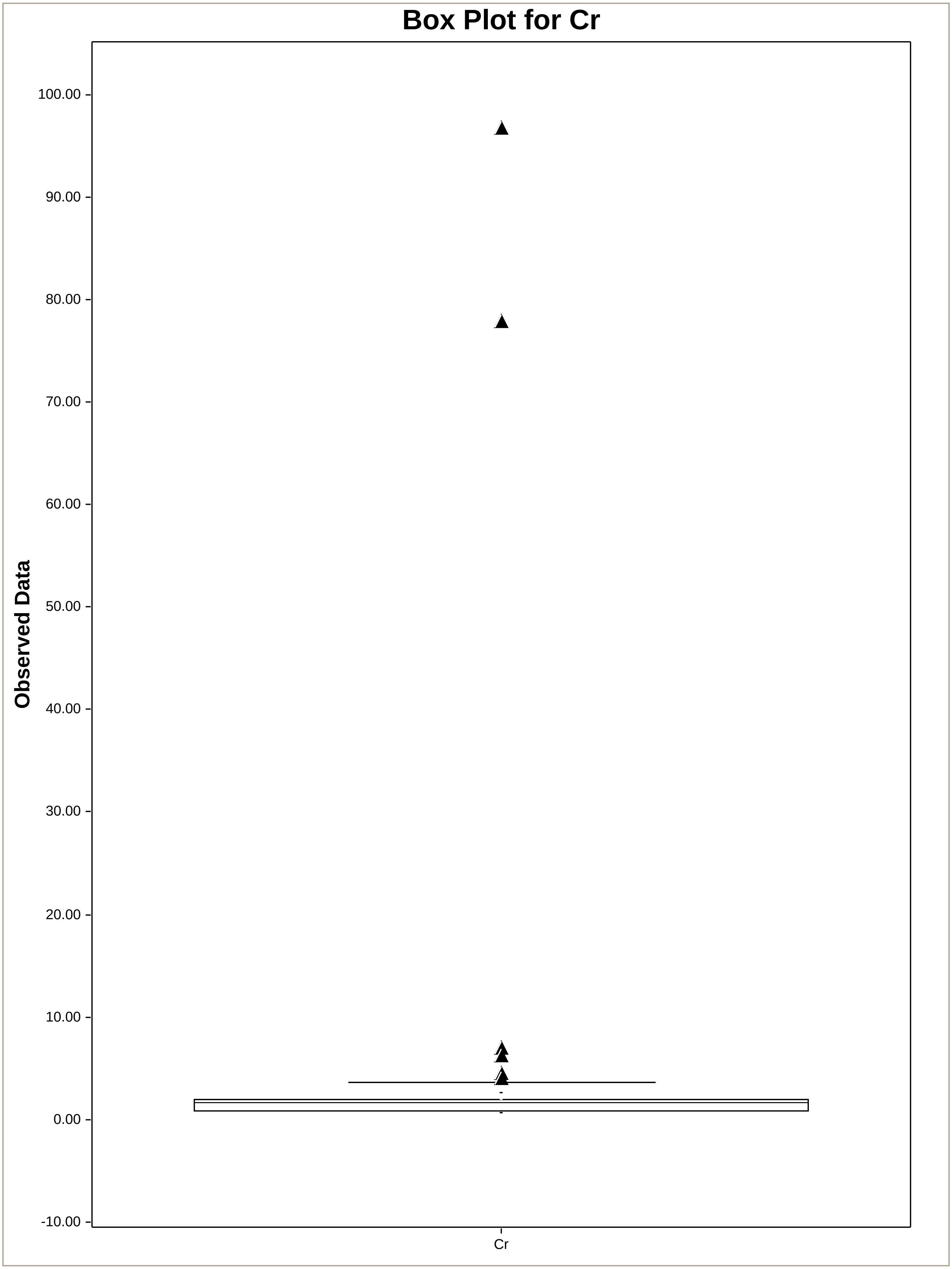

Box Plot for Bromodichloromethane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Bromodichloromethane

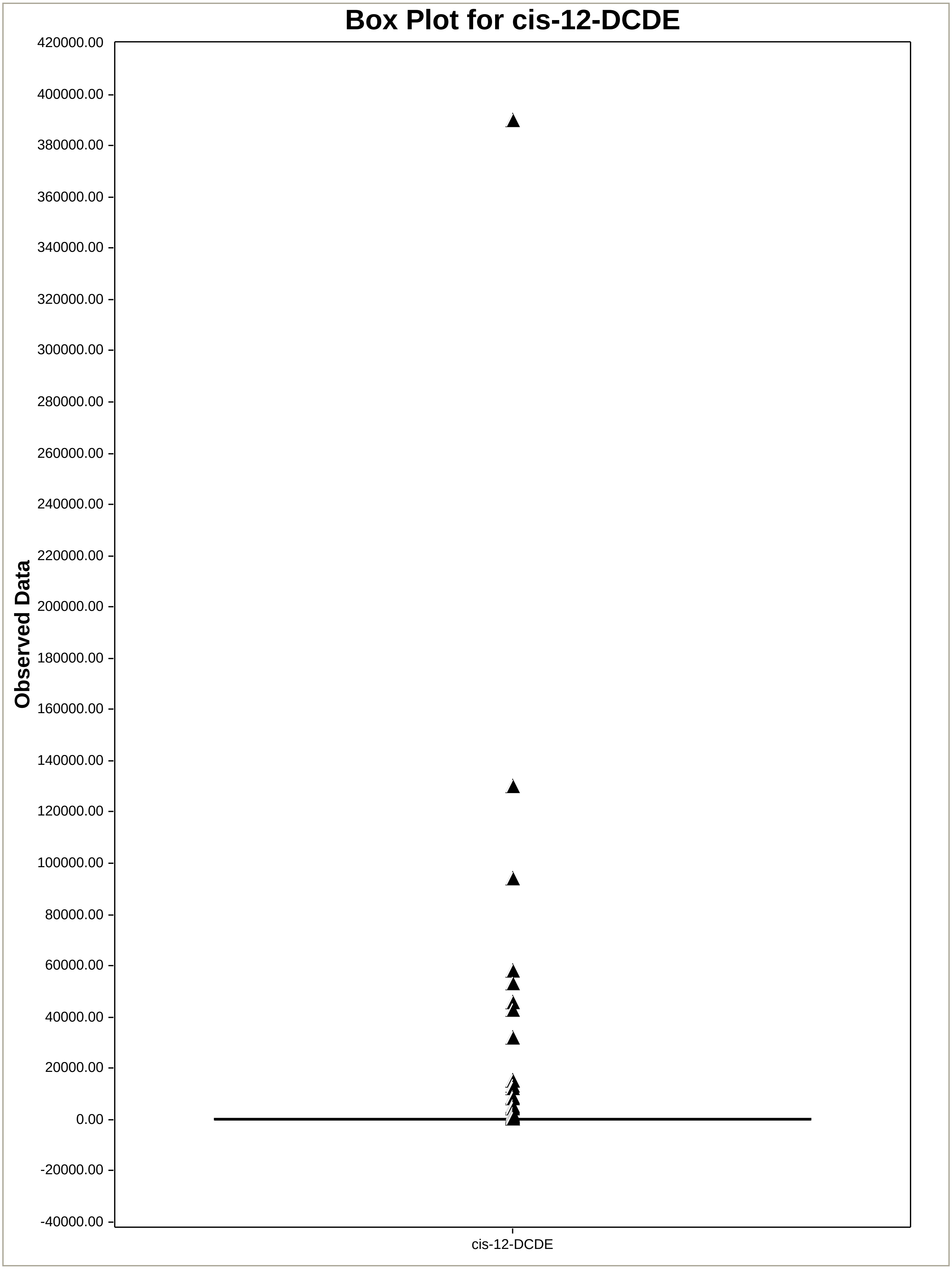

Box Plot for Cadmium
Observed Data
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
Cadmium


Box Plot for Chlorobenzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Chlorobenzene

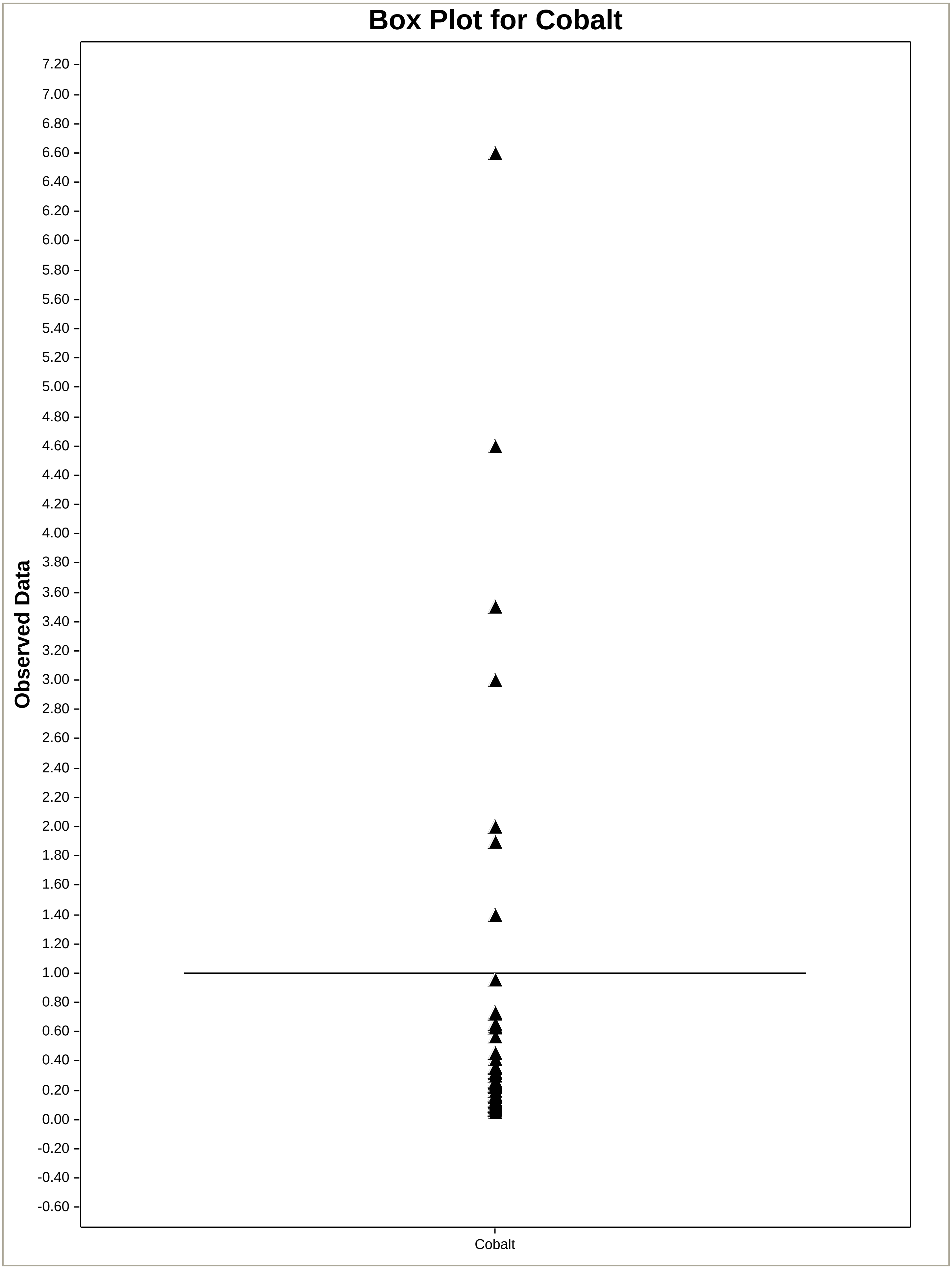
Box Plot for Chloroform

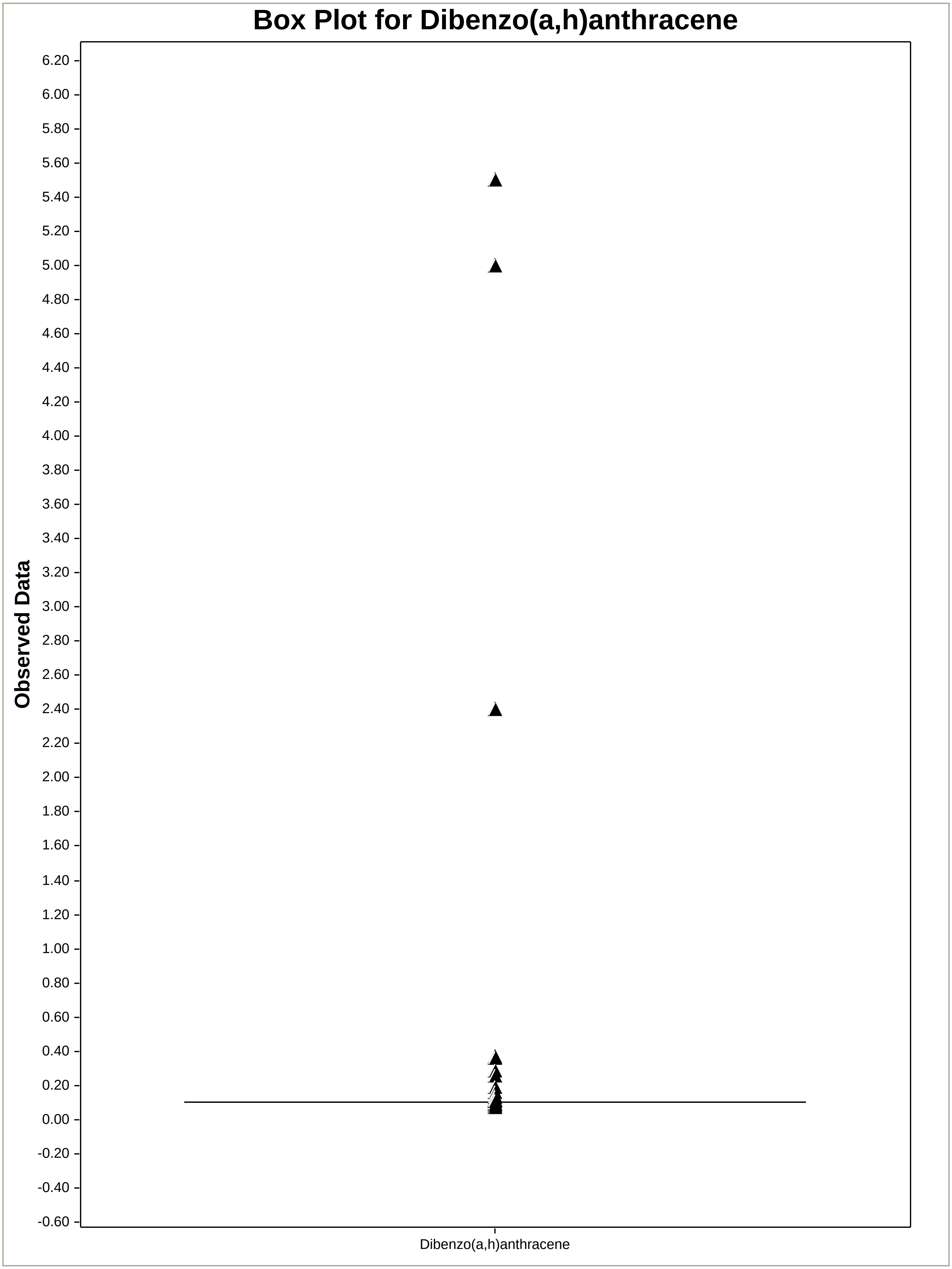


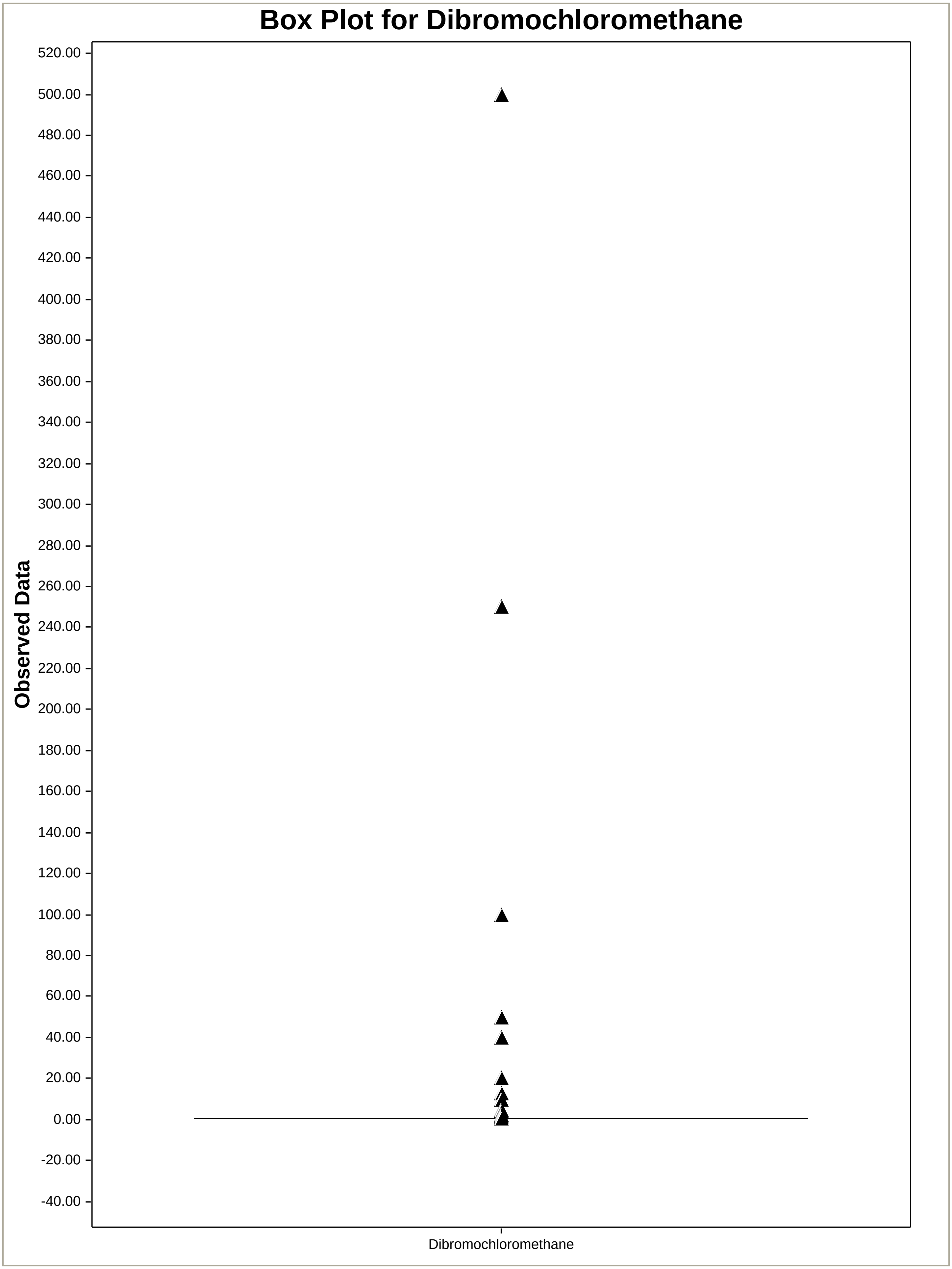

Box Plot for Cr
Observed Data
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
Cr

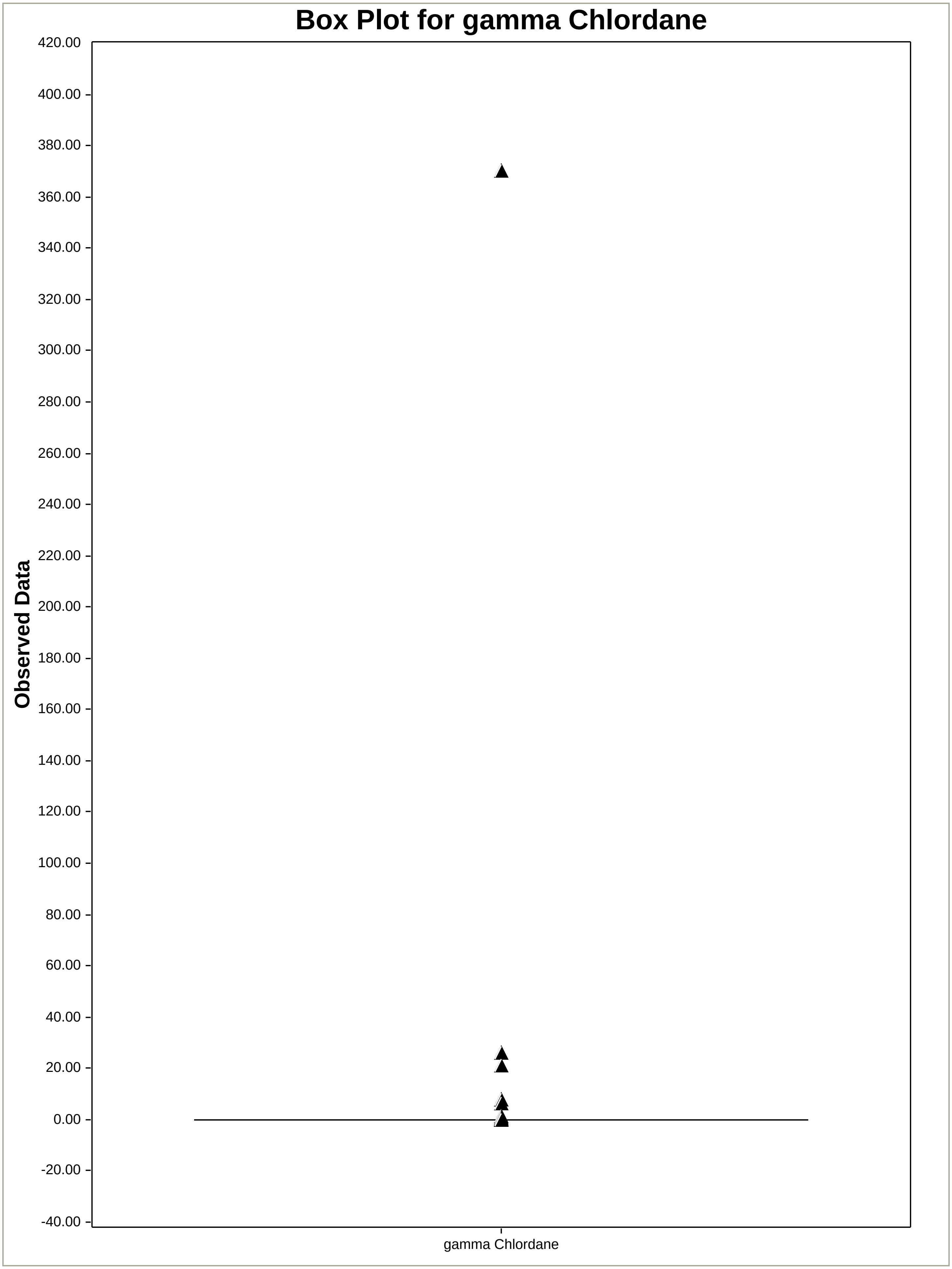


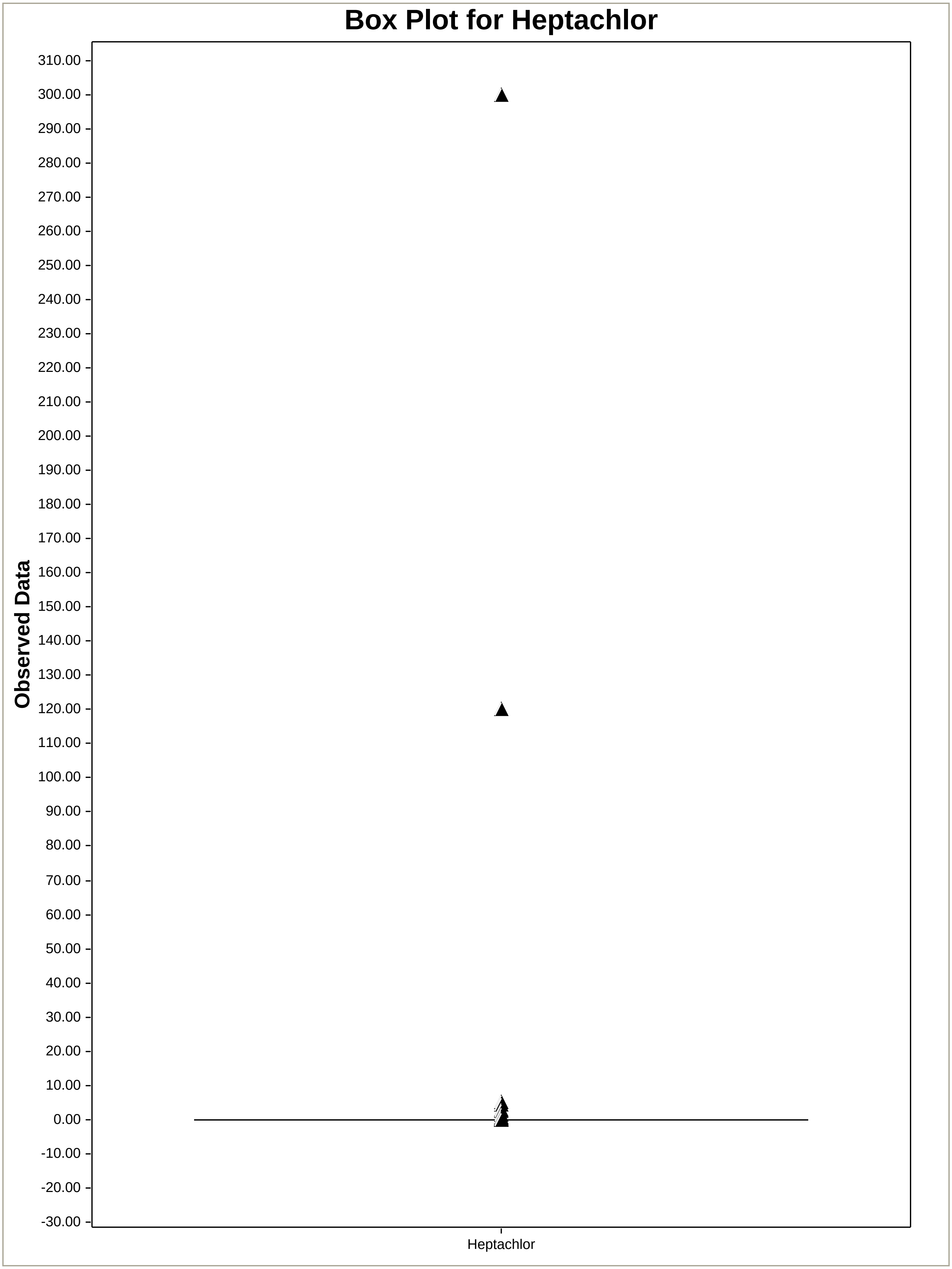
Box Plot for cis-12-DCDE
Observed Data
420000.00
400000.00
380000.00
360000.00
340000.00
320000.00
300000.00
280000.00
260000.00
240000.00
220000.00
200000.00
180000.00
160000.00
140000.00
120000.00
100000.00
80000.00
60000.00
40000.00
20000.00
0.00
-20000.00
-40000.00
cis-12-DCDE

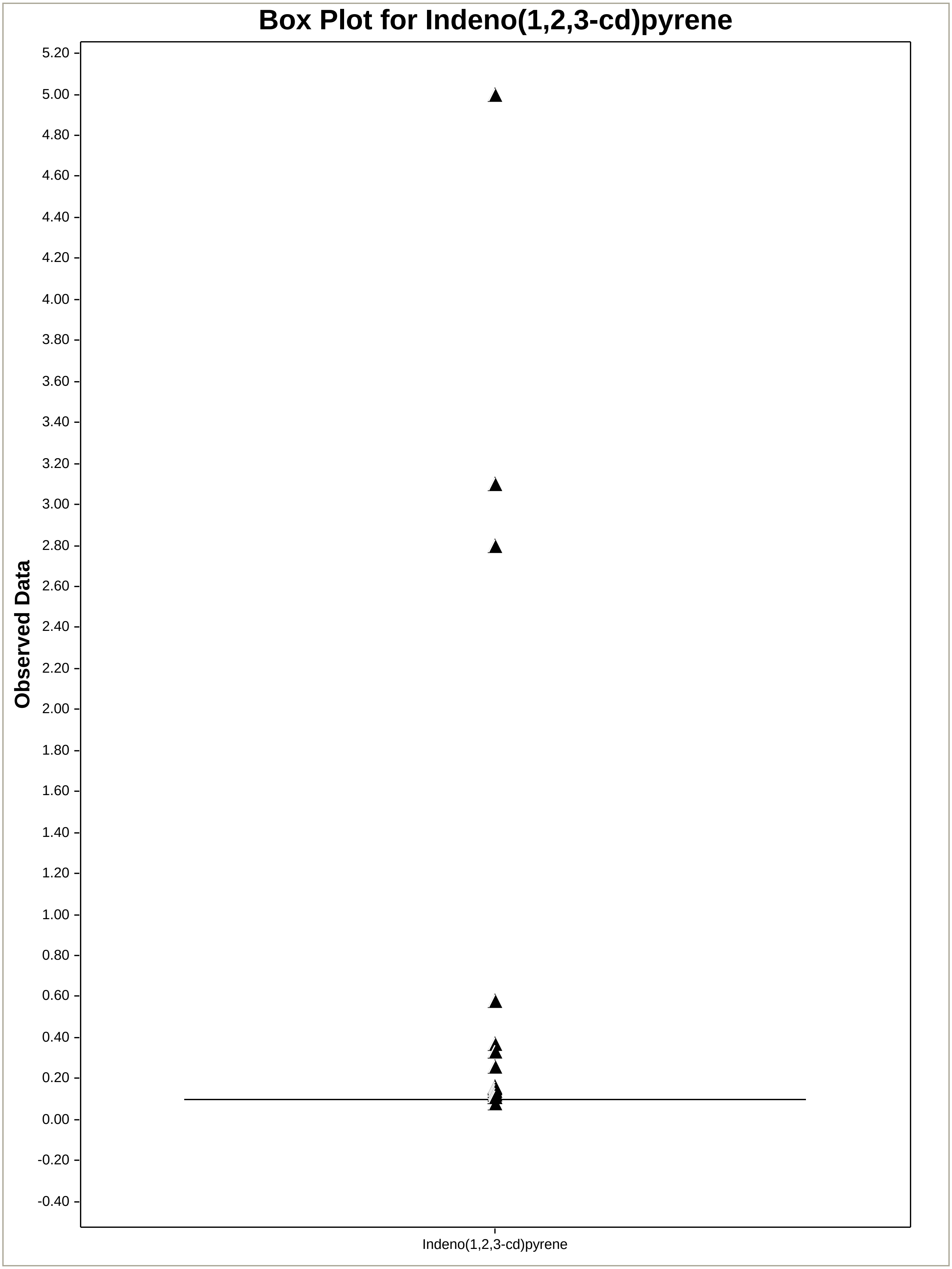

Box Plot for Cobalt
Observed Data
7.20
7.00
6.80
6.60
6.40
6.20
6.00
5.80
5.60
5.40
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
Cobalt

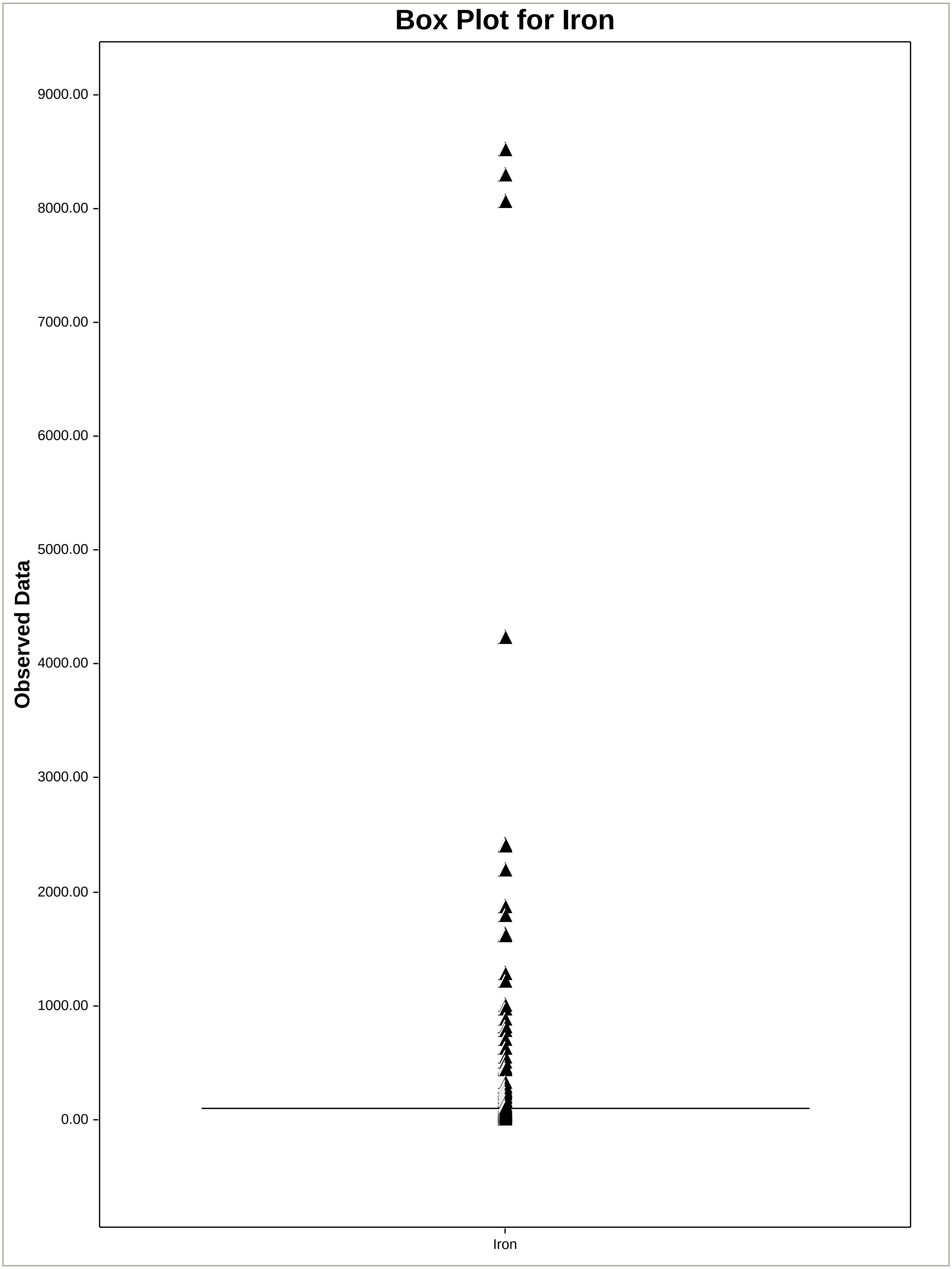

Box Plot for Dibenzo(a,h)anthracene
Observed Data
6.20
6.00
5.80
5.60
5.40
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
Dibenzo(a,h)anthracene

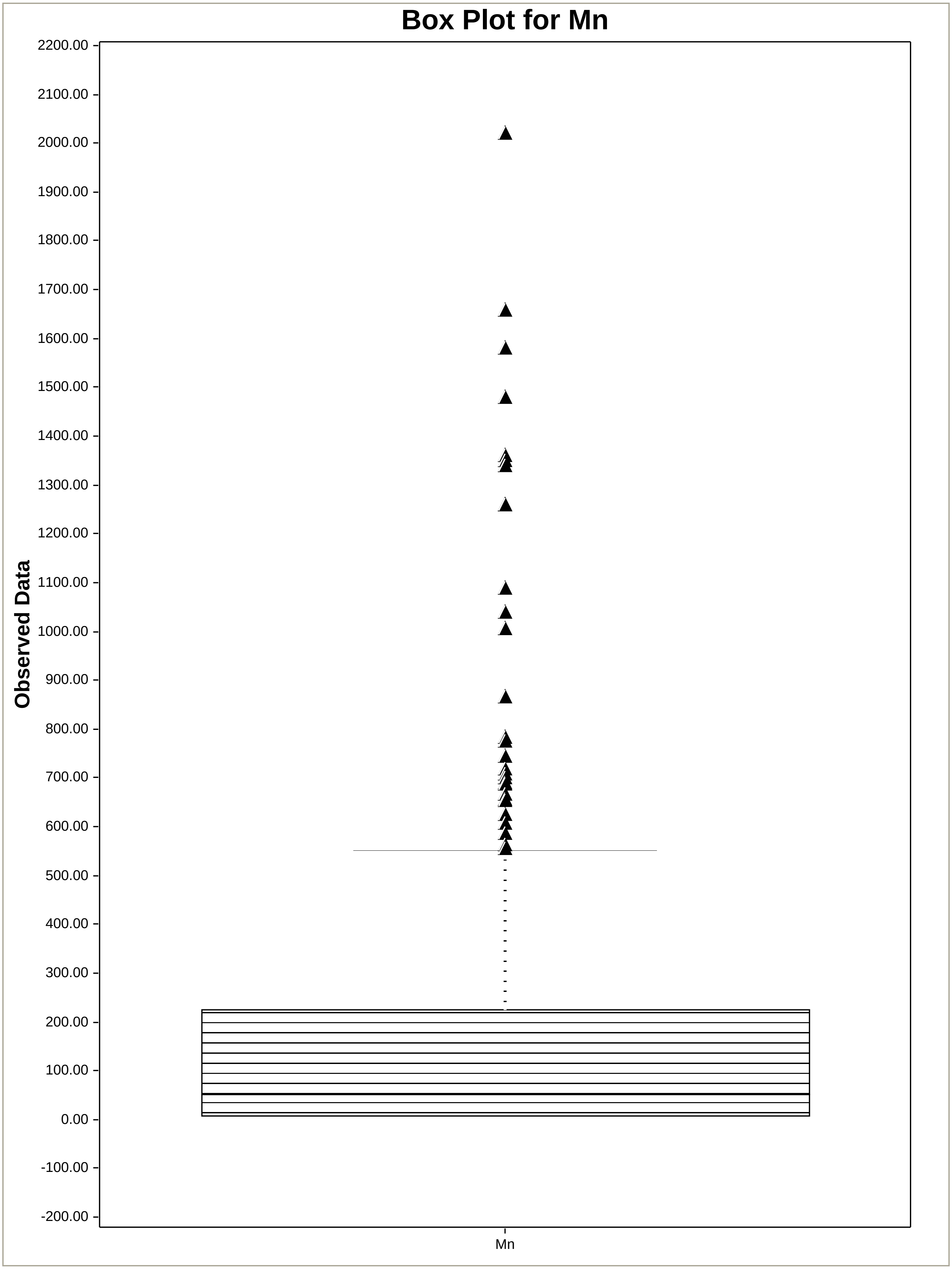

Box Plot for Dibromochloromethane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Dibromochloromethane

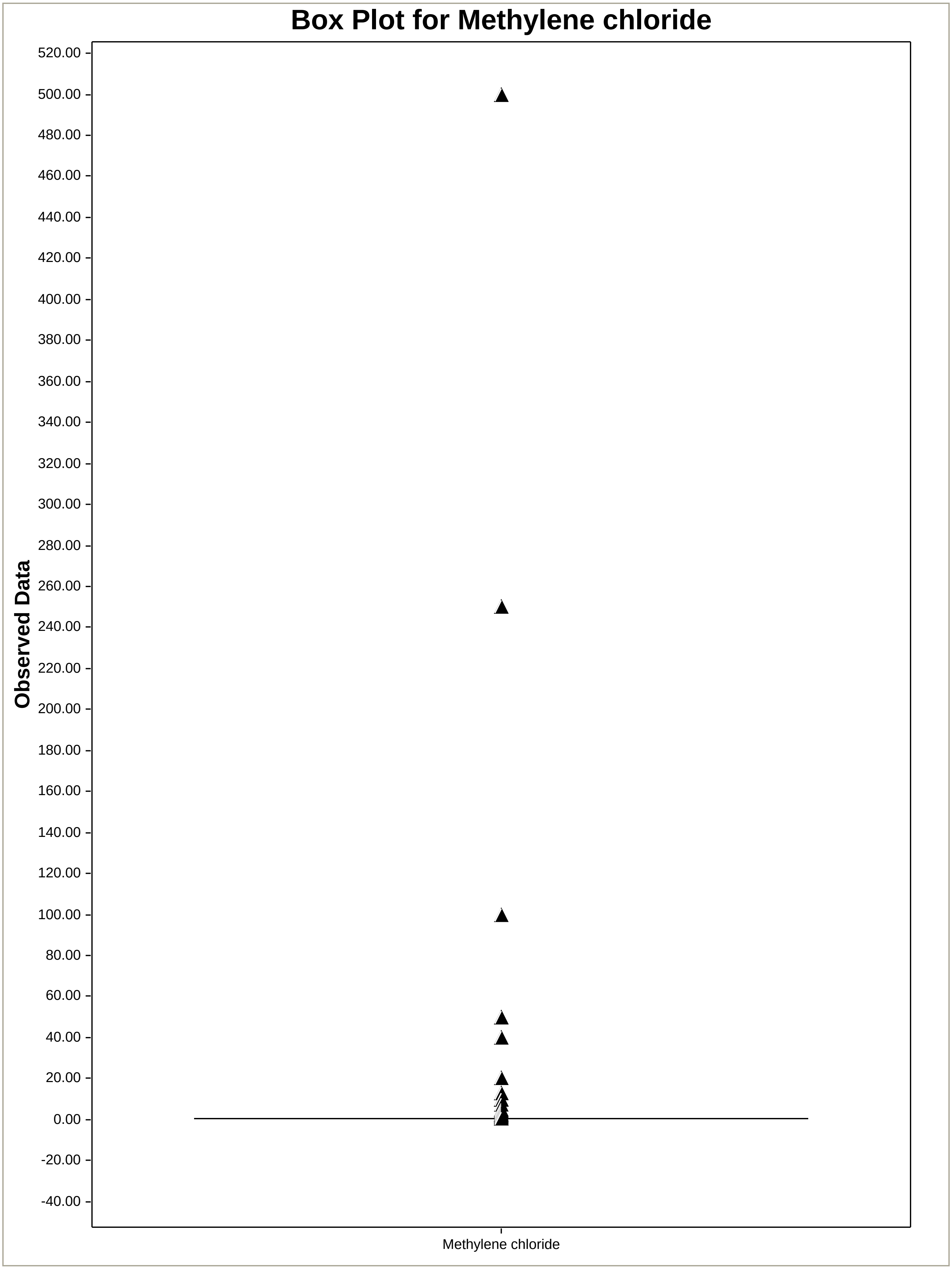

Box Plot for gamma Chlordane
Observed Data
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
gamma Chlordane

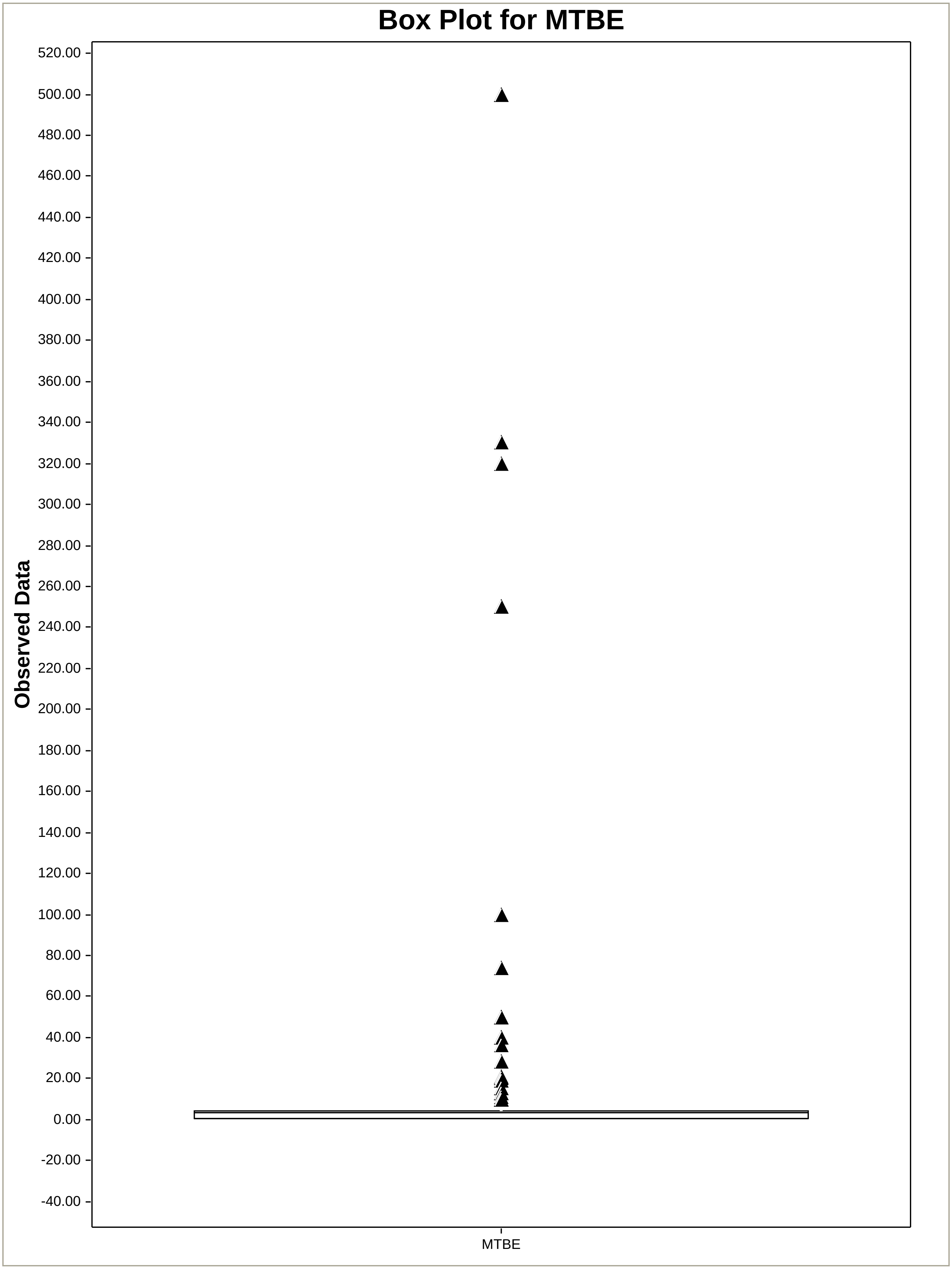

Box Plot for Heptachlor
Observed Data
310.00
300.00
290.00
280.00
270.00
260.00
250.00
240.00
230.00
220.00
210.00
200.00
190.00
180.00
170.00
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
Heptachlor

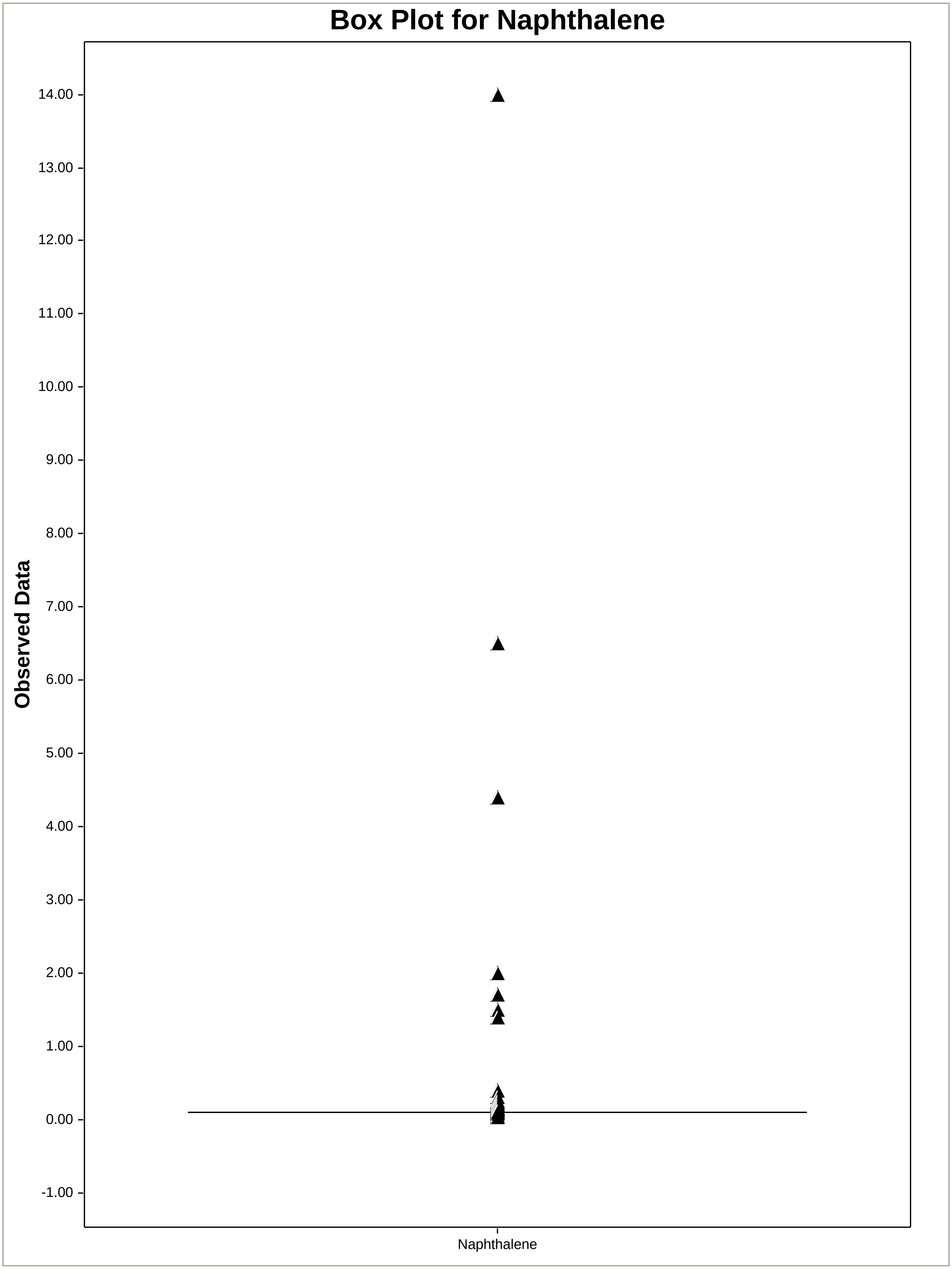

Box Plot for Indeno(1,2,3-cd)pyrene
Observed Data
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
Indeno(1,2,3-cd)pyrene

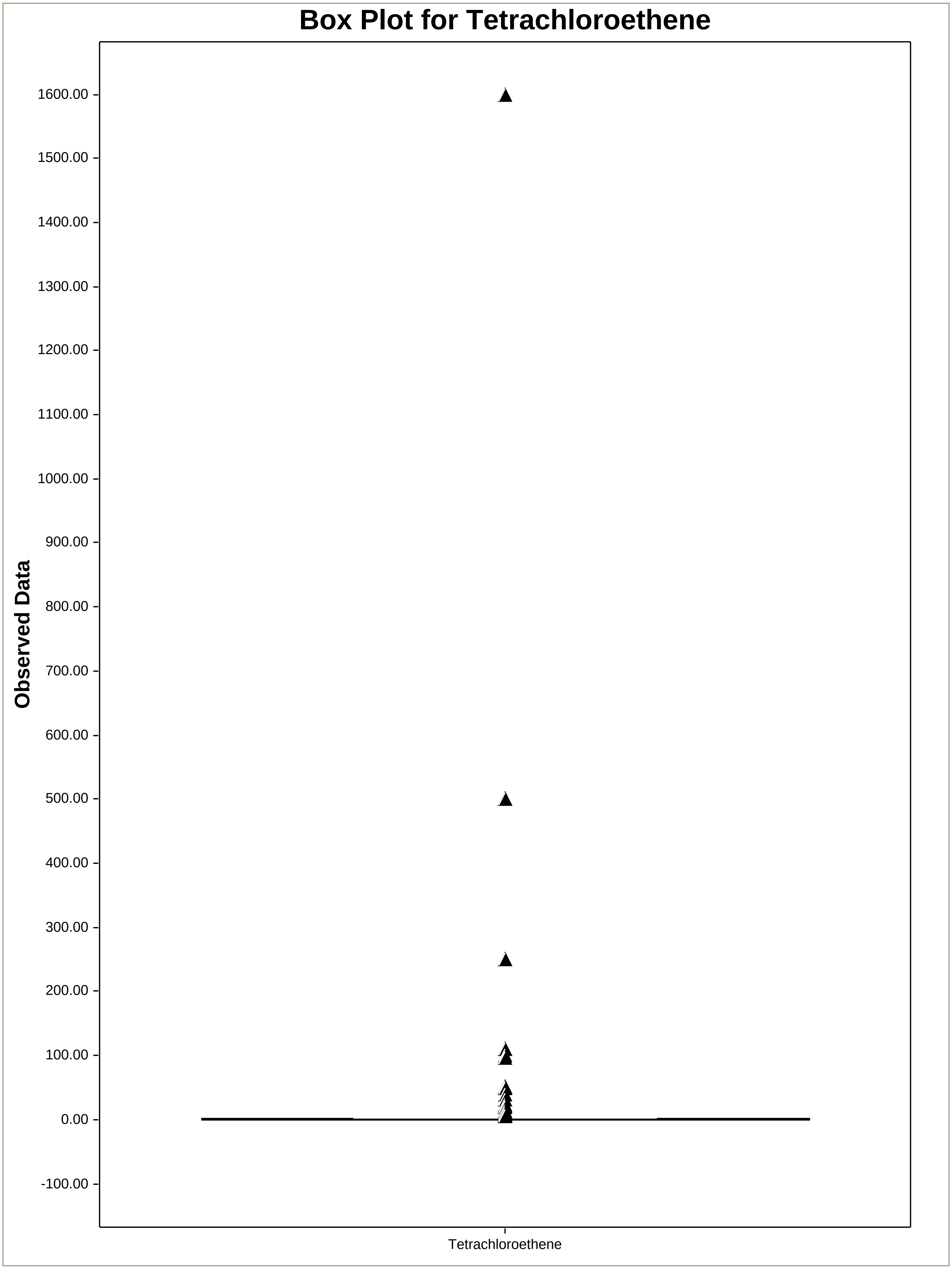

Box Plot for Iron
Observed Data
9000.00
8000.00
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
Iron


Box Plot for Mn
Observed Data
2200.00
2100.00
2000.00
1900.00
1800.00
1700.00
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
-200.00
Mn

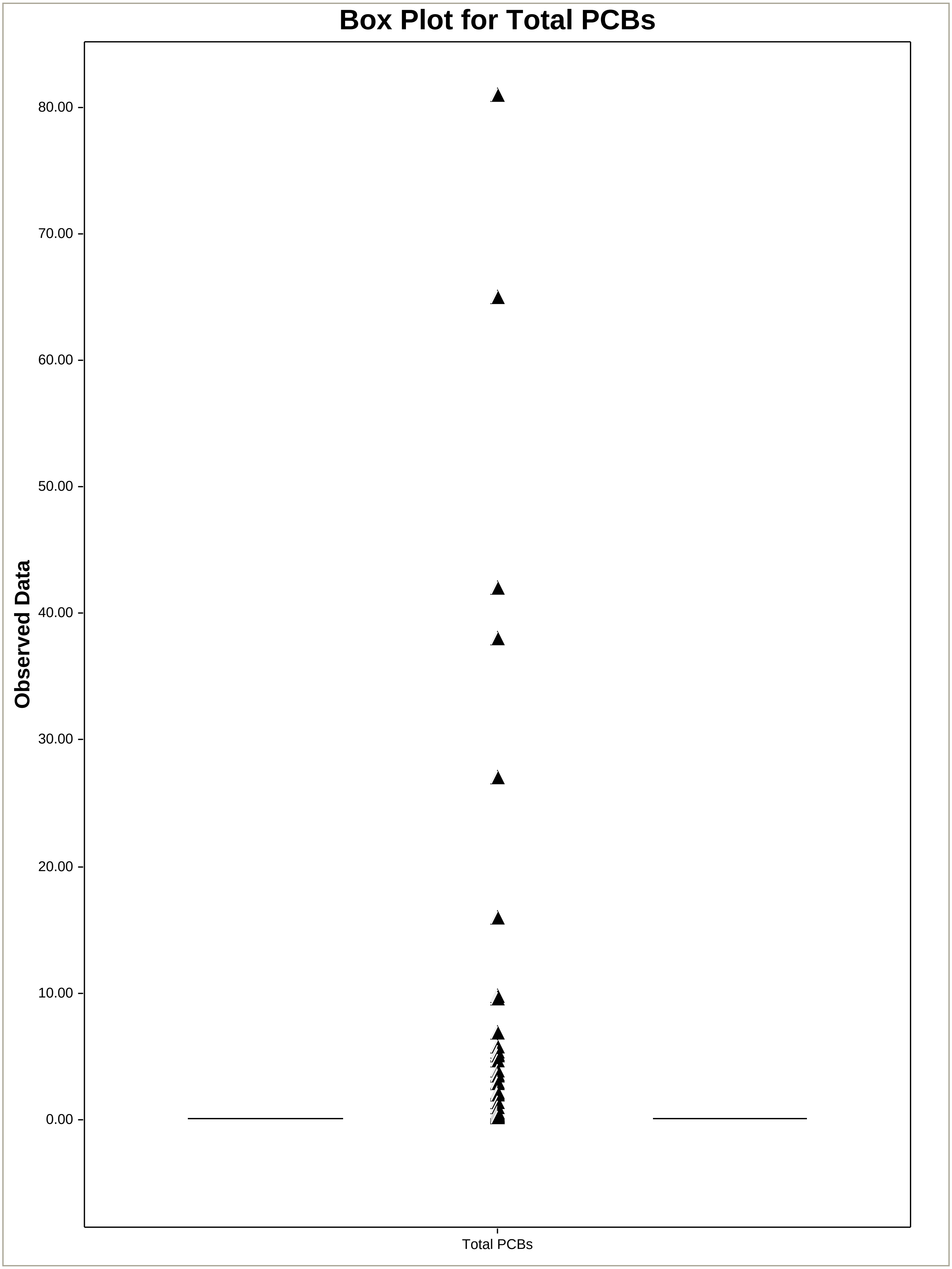

Box Plot for Methylene chloride
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Methylene chloride

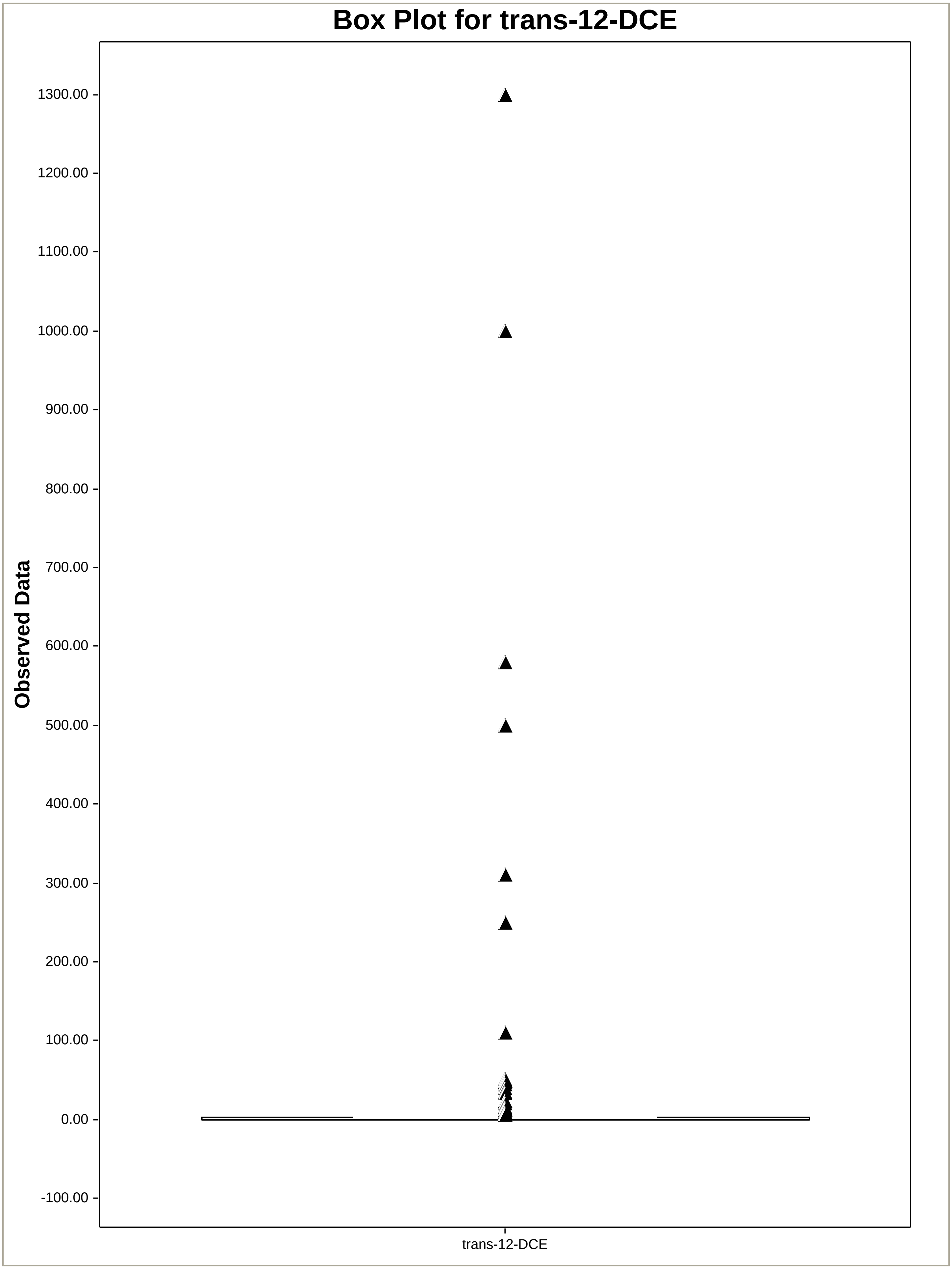

Box Plot for MTBE
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
MTBE


Box Plot for Naphthalene
Observed Data
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
Naphthalene



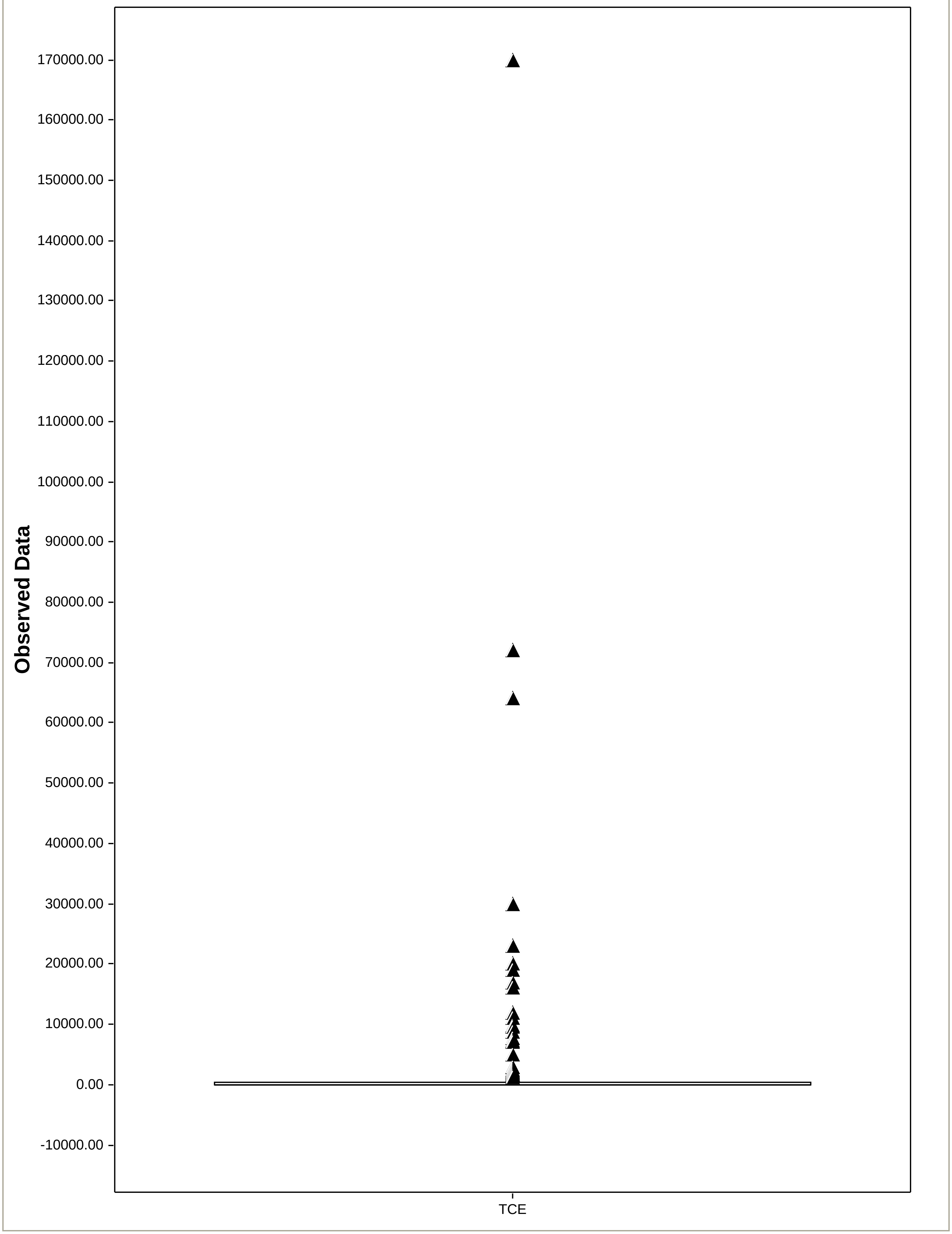
Box Plot for Tetrachloroethene
Observed Data
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
Tetrachloroethene

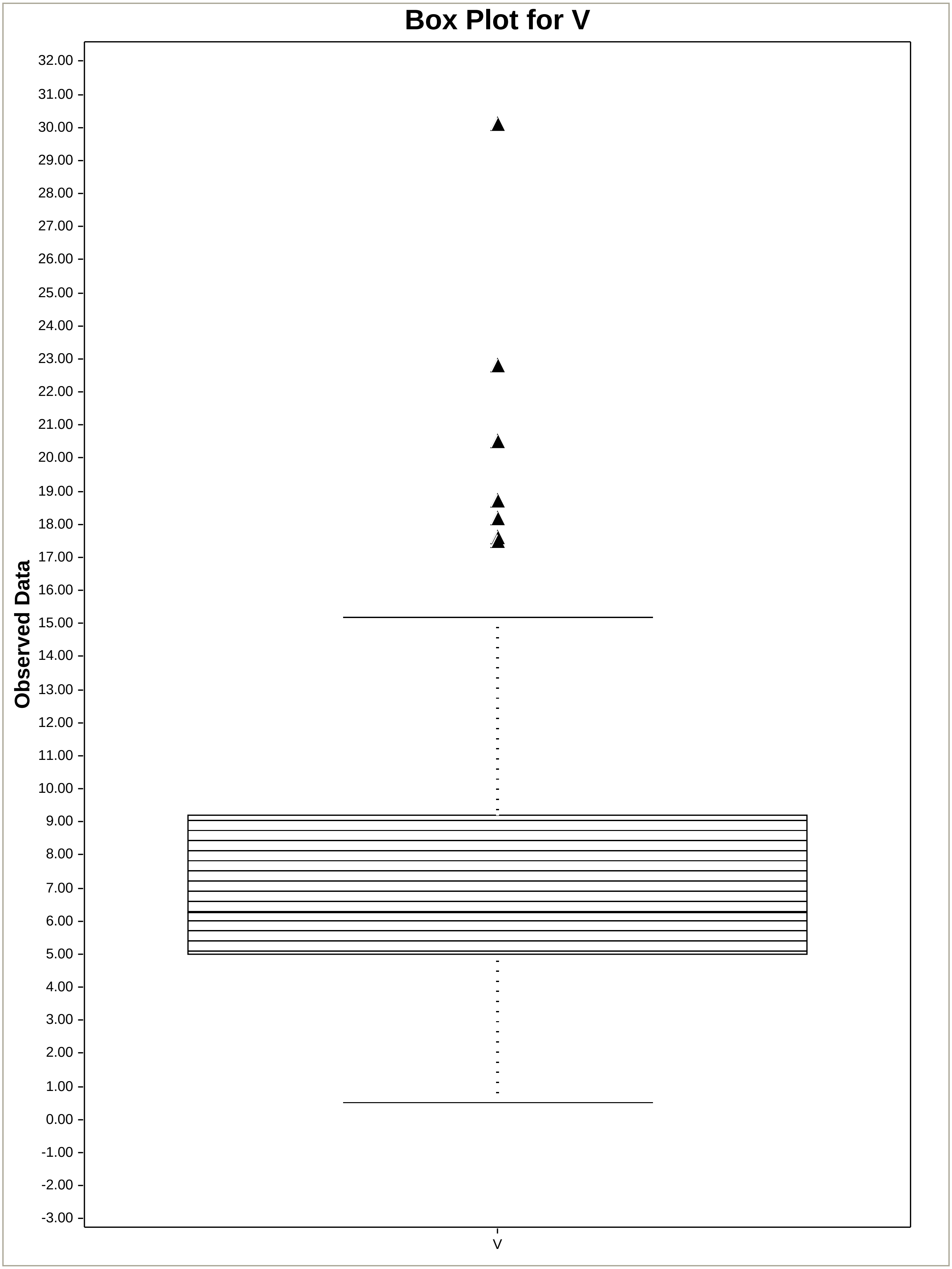

Box Plot for Total PCBs
Observed Data
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Total PCBs

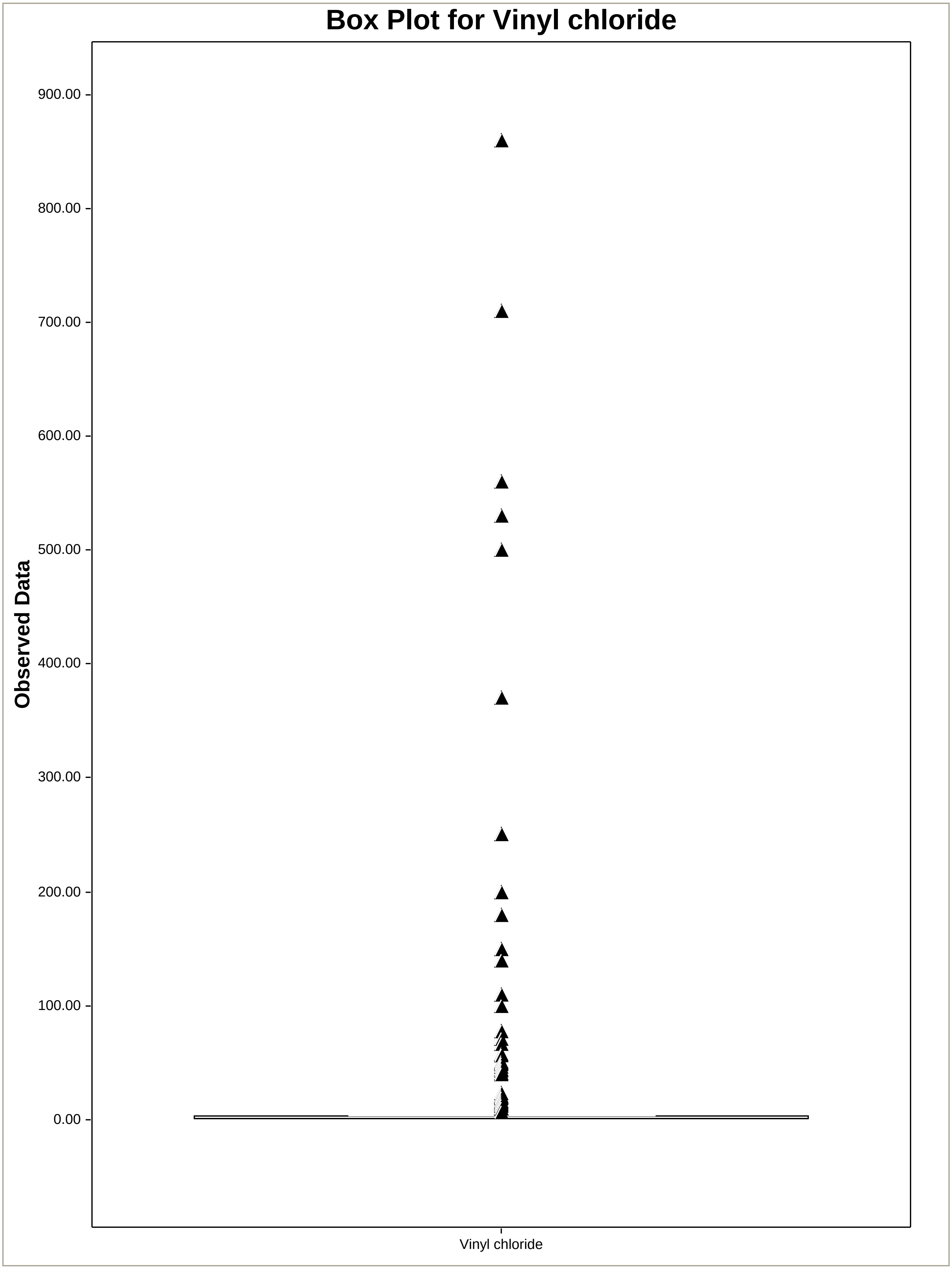


Box Plot for trans-12-DCE
Observed Data
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
trans-12-DCE

Box Plot for TCE




Box Plot for V
Observed Data
32.00
31.00
30.00
29.00
28.00
27.00
26.00
25.00
24.00
23.00
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
V


Box Plot for Vinyl chloride
Observed Data
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Vinyl chloride

Benzene

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
		Percent Non-Detects	87.50%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.21	Minimum Detected	-1.561
Maximum Detected	1.8	Maximum Detected	0.588
Mean of Detected	1.005	Mean of Detected	-0.486
SD of Detected	1.124	SD of Detected	1.519
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.407	Mean	-1.173
SD	0.448	SD	0.621
95% DL/2 (t) UCL	0.603	95% H-Stat (DL/2) UCL	0.533
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.316
5% K-S Critical Value	N/A	SD	0.397
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.145
		95% KM (t) UCL	0.57
Assuming Gamma Distribution		95% KM (z) UCL	0.554
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.379
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	1.8
Mean	N/A	95% KM (Percentile Bootstrap) UCL	1.8
Median	N/A	95% KM (Chebyshev) UCL	0.947
SD	N/A	97.5% KM (Chebyshev) UCL	1.22
k star	N/A	99% KM (Chebyshev) UCL	1.757
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	1.22
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Bromodichloromethane

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
		Percent Non-Detects	87.50%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	0.7	Maximum Detected	-0.357
Mean of Detected	0.475	Mean of Detected	-0.871
SD of Detected	0.318	SD of Detected	0.728
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.341	Mean	-1.221
SD	0.267	SD	0.463
95% DL/2 (t) UCL	0.458	95% H-Stat (DL/2) UCL	0.417
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.28
5% K-S Critical Value	N/A	SD	0.112
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.041
		95% KM (t) UCL	0.352
Assuming Gamma Distribution		95% KM (z) UCL	0.347
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.581
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	0.7
Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.7
Median	N/A	95% KM (Chebyshev) UCL	0.459
SD	N/A	97.5% KM (Chebyshev) UCL	0.536
k star	N/A	99% KM (Chebyshev) UCL	0.688
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.352
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	0.7
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Chloroform

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	11
		Percent Non-Detects	68.75%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.68	Minimum Detected	-0.386
Maximum Detected	3	Maximum Detected	1.099
Mean of Detected	1.874	Mean of Detected	0.454
SD of Detected	1.065	SD of Detected	0.705
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.50%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.842	Shapiro Wilk Test Statistic	0.804
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.82	Mean	-0.711
SD	0.95	SD	0.973
95% DL/2 (t) UCL	1.236	95% H-Stat (DL/2) UCL	1.54
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.907
		SD in Log Scale	1.175
		Mean in Original Scale	0.769
		SD in Original Scale	0.955
		95% t UCL	1.188
		95% Percentile Bootstrap UCL	1.177
		95% BCA Bootstrap UCL	1.251
		95% H-UCL	1.992
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.343	Data appear Normal at 5% Significance Level	
Theta Star	1.395		
nu star	13.43		
A-D Test Statistic	0.611	Nonparametric Statistics	
5% A-D Critical Value	0.683	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.683	Mean	1.062
5% K-S Critical Value	0.359	SD	0.773
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.219
		95% KM (t) UCL	1.445
Assuming Gamma Distribution		95% KM (z) UCL	1.421
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.381
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.453
Maximum	3	95% KM (BCA) UCL	2.563
Mean	0.586	95% KM (Percentile Bootstrap) UCL	2.481
Median	1.00E-06	95% KM (Chebyshev) UCL	2.015
SD	1.052	97.5% KM (Chebyshev) UCL	2.427
k star	0.117	99% KM (Chebyshev) UCL	3.237
Theta star	4.999		
Nu star	3.749	Potential UCLs to Use	
AppChi2	0.625	95% KM (t) UCL	1.445
95% Gamma Approximate UCL	3.512	95% KM (Percentile Bootstrap) UCL	2.481
95% Adjusted Gamma UCL	4.387		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

cis-1,2-Dichlorothene

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	12
Number of Distinct Detected Data	12	Number of Non-Detect Data	4
		Percent Non-Detects	25.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.32	Minimum Detected	-1.139
Maximum Detected	110	Maximum Detected	4.7
Mean of Detected	21.7	Mean of Detected	1.684
SD of Detected	32.28	SD of Detected	2.074
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.71	Shapiro Wilk Test Statistic	0.917
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	16.34	Mean	0.916
SD	29.26	SD	2.245
95% DL/2 (t) UCL	29.16	95% H-Stat (DL/2) UCL	544.3
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.62	Mean in Log Scale	1.005
SD	42.91	SD in Log Scale	2.199
95% MLE (t) UCL	20.42	Mean in Original Scale	16.4
95% MLE (Tiku) UCL	23.44	SD in Original Scale	29.22
		95% t UCL	29.21
		95% Percentile Bootstrap UCL	29.4
		95% BCA Bootstrap UCL	33.15
		95% H UCL	482
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.402	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	54.01		
nu star	9.642		
A-D Test Statistic	0.354	Nonparametric Statistics	
5% A-D Critical Value	0.792	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.792	Mean	16.37
5% K-S Critical Value	0.26	SD	28.31
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	7.392
		95% KM (t) UCL	29.33
Assuming Gamma Distribution		95% KM (z) UCL	28.53
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	29.18
Minimum	1.00E-06	95% KM (bootstrap t) UCL	42.04
Maximum	110	95% KM (BCA) UCL	30.79
Mean	16.27	95% KM (Percentile Bootstrap) UCL	29.47
Median	1.465	95% KM (Chebyshev) UCL	48.59
SD	29.3	97.5% KM (Chebyshev) UCL	62.54
k star	0.167	99% KM (Chebyshev) UCL	89.92
Theta star	97.68		
Nu star	5.331	Potential UCLs to Use	
AppChi2	1.308	95% KM (Chebyshev) UCL	48.59
95% Gamma Approximate UCL	66.32		
95% Adjusted Gamma UCL	79.05		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Tetrachloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	13
		Percent Non-Detects	81.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.19	Minimum Detected	-1.661
Maximum Detected	0.81	Maximum Detected	-0.211
Mean of Detected	0.427	Mean of Detected	-1.048
SD of Detected	0.335	SD of Detected	0.751
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.856	Shapiro Wilk Test Statistic	0.933
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.346	Mean	-1.222
SD	0.279	SD	0.492
95% DL/2 (t) UCL	0.468	95% H-Stat (DL/2) UCL	0.431
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.386
		SD in Log Scale	0.528
		Mean in Original Scale	0.287
		SD in Original Scale	0.174
		95% t UCL	0.364
		95% Percentile Bootstrap UCL	0.36
		95% BCA Bootstrap UCL	0.387
		95% H-UCL	0.382
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.273
5% K-S Critical Value	N/A	SD	0.15
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0581
		95% KM (t) UCL	0.375
Assuming Gamma Distribution		95% KM (z) UCL	0.369
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.394
Minimum	N/A	95% KM (bootstrap t) UCL	0.431
Maximum	N/A	95% KM (BCA) UCL	0.81
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.527
SD	N/A	97.5% KM (Chebyshev) UCL	0.636
k star	N/A	99% KM (Chebyshev) UCL	0.852
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.375
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	14
Number of Distinct Detected Data	14	Number of Non-Detect Data	2
		Percent Non-Detects	12.50%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.43	Minimum Detected	-0.844
Maximum Detected	310	Maximum Detected	5.737
Mean of Detected	42.1	Mean of Detected	2.115
SD of Detected	84.77	SD of Detected	1.871
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.556	Shapiro Wilk Test Statistic	0.922
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	36.86	Mean	1.677
SD	80.2	SD	2.113
95% DL/2 (t) UCL	72.01	95% H-Stat (DL/2) UCL	642.2
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	25.11	Mean in Log Scale	1.676
SD	89.15	SD in Log Scale	2.121
95% MLE (t) UCL	64.18	Mean in Original Scale	36.87
95% MLE (Tiku) UCL	63.03	SD in Original Scale	80.2
		95% t UCL	72.02
		95% Percentile Bootstrap UCL	72.17
		95% BCA Bootstrap UCL	88.67
		95% H UCL	663.7
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.365	Data appear Lognormal at 5% Significance Level	
Theta Star	115.2		
nu star	10.23		
A-D Test Statistic	1.178	Nonparametric Statistics	
5% A-D Critical Value	0.812	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.812	Mean	36.89
5% K-S Critical Value	0.245	SD	77.65
Data not Gamma Distributed at 5% Significance Level		SE of Mean	20.14
		95% KM (t) UCL	72.2
Assuming Gamma Distribution		95% KM (z) UCL	70.02
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	71.93
Minimum	1.00E-06	95% KM (bootstrap t) UCL	128.4
Maximum	310	95% KM (BCA) UCL	76.99
Mean	36.83	95% KM (Percentile Bootstrap) UCL	72.45
Median	3.95	95% KM (Chebyshev) UCL	124.7
SD	80.22	97.5% KM (Chebyshev) UCL	162.7
k star	0.212	99% KM (Chebyshev) UCL	237.3
Theta star	173.7		
Nu star	6.787	Potential UCLs to Use	
AppChi2	2.054	99% KM (Chebyshev) UCL	237.3
95% Gamma Approximate UCL	121.7		
95% Adjusted Gamma UCL	141.1		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Indeno(1,2,3-cd)pyrene

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	3
Number of Distinct Detected Data	2	Number of Non-Detect Data	13
		Percent Non-Detects	81.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	0.15	Maximum Detected	-1.897
Mean of Detected	0.137	Mean of Detected	-2.001
SD of Detected	0.0231	SD of Detected	0.179
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Test Statistic	0.75
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0663	Mean	-2.809
SD	0.0359	SD	0.406
95% DL/2 (t) UCL	0.082	95% H-Stat (DL/2) UCL	0.0804
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.139	Mean in Log Scale	-2.644
SD	0.0189	SD in Log Scale	0.437
95% MLE (t) UCL	0.147	Mean in Original Scale	0.0778
95% MLE (Tiku) UCL	0.158	SD in Original Scale	0.0352
		95% t UCL	0.0932
		95% Percentile Bootstrap UCL	0.0918
		95% BCA Bootstrap UCL	0.0948
		95% H UCL	0.0979
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.115
5% K-S Critical Value	N/A	SD	0.0132
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00405
		95% KM (t) UCL	0.122
Assuming Gamma Distribution		95% KM (z) UCL	0.122
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.133
SD	N/A	97.5% KM (Chebyshev) UCL	0.14
k star	N/A	99% KM (Chebyshev) UCL	0.155
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.122
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics - Data are in µg/L.

Number of Valid Data	16	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
		Percent Non-Detects	87.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.1	Minimum Detected	-2.303
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.13	Mean of Detected	-2.068
SD of Detected	0.0424	SD of Detected	0.332
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.06	Mean	-2.88
SD	0.0294	SD	0.328
95% DL/2 (t) UCL	0.0729	95% H-Stat (DL/2) UCL	0.0696
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.104
5% K-S Critical Value	N/A	SD	0.0145
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00513
		95% KM (t) UCL	0.113
Assuming Gamma Distribution		95% KM (z) UCL	0.112
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.126
SD	N/A	97.5% KM (Chebyshev) UCL	0.136
k star	N/A	99% KM (Chebyshev) UCL	0.155
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.113
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Total Polychlorinated Biphenyls (Aroclors)

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	13
		Percent Non-Detects	81.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.038	Minimum Detected	-3.27
Maximum Detected	2.2	Maximum Detected	0.788
Mean of Detected	0.896	Mean of Detected	-1.093
SD of Detected	1.148	SD of Detected	2.045
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.50%

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Test Statistic	0.984
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.198	Mean	-2.926
SD	0.544	SD	1.214
95% DL/2 (t) UCL	0.436	95% H-Stat (DL/2) UCL	0.291
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.981
		SD in Log Scale	1.567
		Mean in Original Scale	0.213
		SD in Original Scale	0.541
		95% t UCL	0.45
		95% Percentile Bootstrap UCL	0.459
		95% BCA Bootstrap UCL	0.623
		95% H-UCL	0.764
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.199
5% K-S Critical Value	N/A	SD	0.526
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.161
		95% KM (t) UCL	0.481
Assuming Gamma Distribution		95% KM (z) UCL	0.464
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.515
Minimum	N/A	95% KM (bootstrap t) UCL	0.662
Maximum	N/A	95% KM (BCA) UCL	2.2
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.901
SD	N/A	97.5% KM (Chebyshev) UCL	1.205
k star	N/A	99% KM (Chebyshev) UCL	1.802
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.481
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

4,4'-DDD

General Statistics - Data are in µg/L.

Number of Valid Data	6	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	4
		Percent Non-Detects	66.67%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	0.76	Maximum Detected	-0.274
Mean of Detected	0.435	Mean of Detected	-1.241
SD of Detected	0.46	SD of Detected	1.367
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	4
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	66.67%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.179	Mean	-2.395
SD	0.286	SD	1.084
95% DL/2 (t) UCL	0.414	95% H-Stat (DL/2) UCL	1.397
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.218
5% K-S Critical Value	N/A	SD	0.242
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.14
		95% KM (t) UCL	0.5
Assuming Gamma Distribution		95% KM (z) UCL	0.448
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.828
SD	N/A	97.5% KM (Chebyshev) UCL	1.092
k star	N/A	99% KM (Chebyshev) UCL	1.61
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (BCA) UCL	N/A
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

4,4'-DDT

General Statistics - Data are in µg/L.

Number of Valid Data	16	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
		Percent Non-Detects	87.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.16	Minimum Detected	-1.833
Maximum Detected	1.5	Maximum Detected	0.405
Mean of Detected	0.83	Mean of Detected	-0.714
SD of Detected	0.948	SD of Detected	1.583
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	87.50%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.148	Mean	-2.705
SD	0.362	SD	0.878
95% DL/2 (t) UCL	0.306	95% H-Stat (DL/2) UCL	0.174
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.244
5% K-S Critical Value	N/A	SD	0.324
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.115
		95% KM (t) UCL	0.445
Assuming Gamma Distribution		95% KM (z) UCL	0.432
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.142
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	1.5
Median	N/A	95% KM (Chebyshev) UCL	0.744
SD	N/A	97.5% KM (Chebyshev) UCL	0.96
k star	N/A	99% KM (Chebyshev) UCL	1.385
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	0.96
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Antimony

General Statistics - Data are in µg/L.

Number of Valid Data	16	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
		Percent Non-Detects	87.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.51	Minimum Detected	-0.673
Maximum Detected	2.2	Maximum Detected	0.788
Mean of Detected	1.355	Mean of Detected	0.0576
SD of Detected	1.195	SD of Detected	1.034
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods
Those methods will return a 'N/A' value on your output display

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.044	Mean	0.00719
SD	0.332	SD	0.268
95% DL/2 (t) UCL	1.19	95% H-Stat (DL/2) UCL	1.186
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.616
5% K-S Critical Value	N/A	SD	0.409
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.145
		95% KM (t) UCL	0.869
Assuming Gamma Distribution		95% KM (z) UCL	0.854
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	1.246
SD	N/A	97.5% KM (Chebyshev) UCL	1.519
k star	N/A	99% KM (Chebyshev) UCL	2.055
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (BCA) UCL	N/A
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics - Data are in µg/L.

Number of Valid Observations	16	Number of Distinct Observations	16
Raw Statistics		Log-transformed Statistics	
Minimum	0.75	Minimum of Log Data	-0.288
Maximum	180	Maximum of Log Data	5.193
Mean	52.26	Mean of log Data	2.777
Median	16.7	SD of log Data	1.895
SD	61.13		
Std. Error of Mean	15.28		
Coefficient of Variation	1.17		
Skewness	0.927		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	79.05	95% H-UCL	781.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	257.7
95% Adjusted-CLT UCL (Chen-1995)	81.18	97.5% Chebyshev (MVUE) UCL	336.6
95% Modified-t UCL (Johnson-1978)	79.64	99% Chebyshev (MVUE) UCL	491.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.475	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	110		
MLE of Mean	52.26		
MLE of Standard Deviation	75.83		
nu star	15.2		
Approximate Chi Square Value (.05)	7.402	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	77.4
Adjusted Chi Square Value	6.79	95% Jackknife UCL	79.05
		95% Standard Bootstrap UCL	76.58
Anderson-Darling Test Statistic	0.631	95% Bootstrap-t UCL	85.1
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	78.35
Kolmogorov-Smirnov Test Statistic	0.195	95% Percentile Bootstrap UCL	76.02
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	80.18
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	118.9
		97.5% Chebyshev(Mean, Sd) UCL	147.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	204.3
95% Approximate Gamma UCL	107.3		
95% Adjusted Gamma UCL	117		
Potential UCL to Use		Use 95% Approximate Gamma UCL	107.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician

Chromium

General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	9
		Percent Non-Detects	56.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	3.5	Maximum Detected	1.253
Mean of Detected	1.121	Mean of Detected	-0.472
SD of Detected	1.23	SD of Detected	1.248
Minimum Non-Detect	0.86	Minimum Non-Detect	-0.151
Maximum Non-Detect	2	Maximum Non-Detect	0.693
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.50%

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.971
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.018	Mean	-0.259
SD	0.796	SD	0.838
95% DL/2 (t) UCL	1.366	95% H-Stat (DL/2) UCL	1.87
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.852
		SD in Log Scale	1.034
		Mean in Original Scale	0.721
		SD in Original Scale	0.888
		95% t UCL	1.11
		95% Percentile Bootstrap UCL	1.109
		95% BCA Bootstrap UCL	1.252
		95% H-UCL	1.521
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.658	Data appear Normal at 5% Significance Level	
Theta Star	1.703		
nu star	9.218		
A-D Test Statistic	0.21	Nonparametric Statistics	
5% A-D Critical Value	0.728	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.728	Mean	0.736
5% K-S Critical Value	0.32	SD	0.857
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.251
		95% KM (t) UCL	1.176
Assuming Gamma Distribution		95% KM (z) UCL	1.149
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.173
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.387
Maximum	3.5	95% KM (BCA) UCL	1.198
Mean	0.819	95% KM (Percentile Bootstrap) UCL	1.181
Median	0.535	95% KM (Chebyshev) UCL	1.83
SD	0.939	97.5% KM (Chebyshev) UCL	2.303
k star	0.313	99% KM (Chebyshev) UCL	3.234
Theta star	2.62		
Nu star	10.01	Potential UCLs to Use	
AppChi2	3.947	95% KM (t) UCL	1.176
95% Gamma Approximate UCL	2.078	95% KM (Percentile Bootstrap) UCL	1.181
95% Adjusted Gamma UCL	2.327		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics - Data are in µg/L.

Number of Valid Data	16	Number of Detected Data	6
Number of Distinct Detected Data	5	Number of Non-Detect Data	10
		Percent Non-Detects	62.50%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.13	Minimum Detected	-2.04
Maximum Detected	1.4	Maximum Detected	0.336
Mean of Detected	0.412	Mean of Detected	-1.259
SD of Detected	0.487	SD of Detected	0.829
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.606	Shapiro Wilk Test Statistic	0.801
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.467	Mean	-0.905
SD	0.285	SD	0.556
95% DL/2 (t) UCL	0.592	95% H-Stat (DL/2) UCL	0.639
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.421
		SD in Log Scale	0.673
		Mean in Original Scale	0.313
		SD in Original Scale	0.312
		95% t UCL	0.45
		95% Percentile Bootstrap UCL	0.455
		95% BCA Bootstrap UCL	0.525
		95% H-UCL	0.447
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.857	Data appear Lognormal at 5% Significance Level	
Theta Star	0.481		
nu star	10.28		
A-D Test Statistic	0.915	Nonparametric Statistics	
5% A-D Critical Value	0.708	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.708	Mean	0.288
5% K-S Critical Value	0.338	SD	0.292
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0827
		95% KM (t) UCL	0.433
Assuming Gamma Distribution		95% KM (z) UCL	0.424
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.427
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.787
Maximum	1.4	95% KM (BCA) UCL	0.452
Mean	0.357	95% KM (Percentile Bootstrap) UCL	0.433
Median	0.239	95% KM (Chebyshev) UCL	0.649
SD	0.362	97.5% KM (Chebyshev) UCL	0.804
k star	0.346	99% KM (Chebyshev) UCL	1.111
Theta star	1.031		
Nu star	11.08	Potential UCLs to Use	
AppChi2	4.628	95% KM (t) UCL	0.433
95% Gamma Approximate UCL	0.855	95% KM (% Bootstrap) UCL	0.433
95% Adjusted Gamma UCL	0.95		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.

Manganese

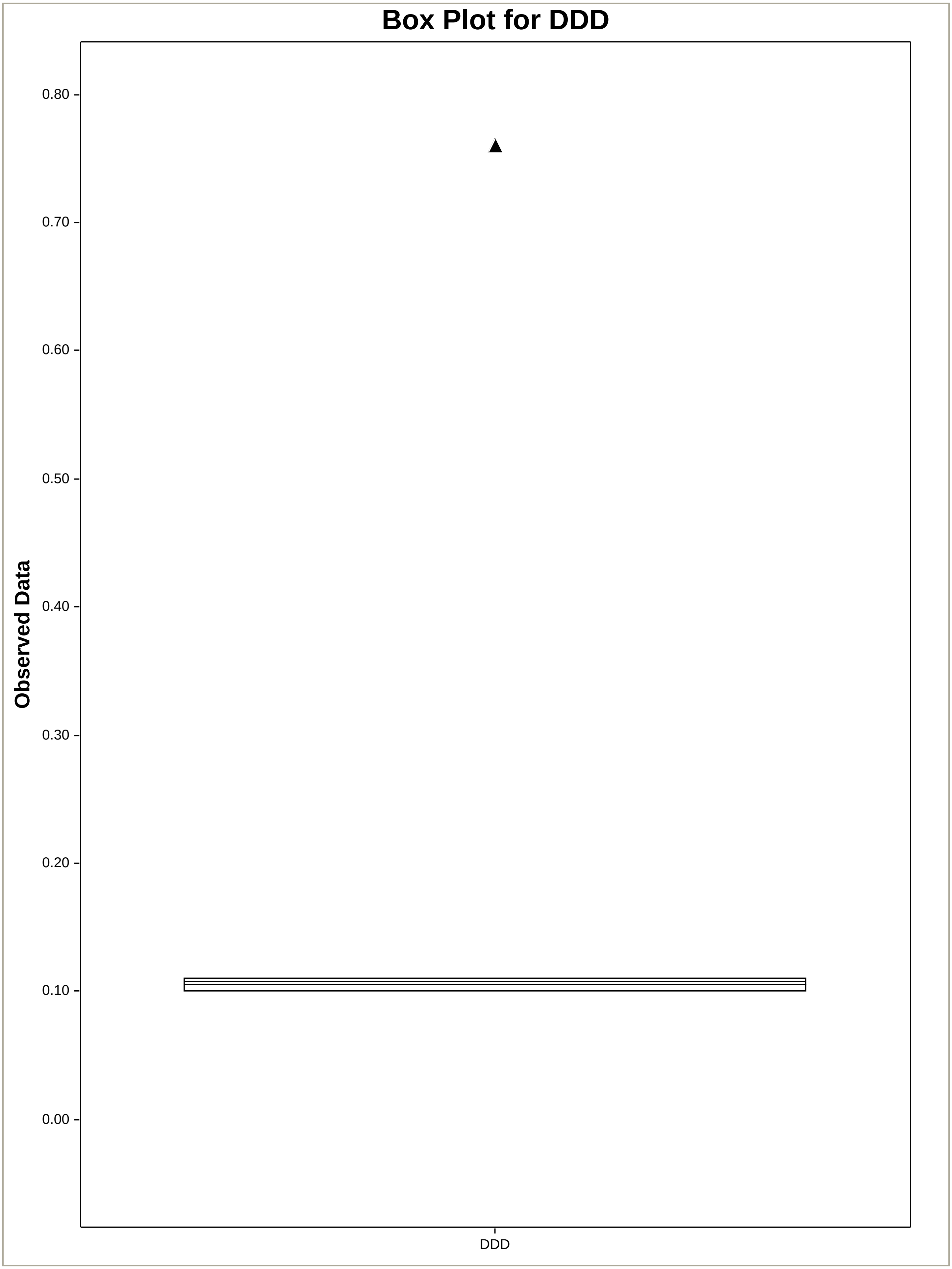
General Statistics - Data are in µg/L.			
Number of Valid Observations	16	Number of Distinct Observations	16
Raw Statistics		Log-transformed Statistics	
Minimum	1.2	Minimum of Log Data	0.182
Maximum	1580	Maximum of Log Data	7.365
Mean	241.9	Mean of log Data	4.046
Median	101.3	SD of log Data	2.177
SD	398.8		
Std. Error of Mean	99.7		
Coefficient of Variation	1.649		
Skewness	2.866		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	416.6	95% H-UCL	9122
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1584
95% Adjusted-CLT UCL (Chen-1995)	482.2	97.5% Chebyshev (MVUE) UCL	2087
95% Modified-t UCL (Johnson-1978)	428.5	99% Chebyshev (MVUE) UCL	3075
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.406	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	596		
MLE of Mean	241.9		
MLE of Standard Deviation	379.7		
nu star	12.98		
Approximate Chi Square Value (.05)	5.882	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	405.8
Adjusted Chi Square Value	5.347	95% Jackknife UCL	416.6
		95% Standard Bootstrap UCL	403.9
Anderson-Darling Test Statistic	0.252	95% Bootstrap-t UCL	690.3
Anderson-Darling 5% Critical Value	0.807	95% Hall's Bootstrap UCL	1114
Kolmogorov-Smirnov Test Statistic	0.117	95% Percentile Bootstrap UCL	422.3
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	495.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	676.4
		97.5% Chebyshev(Mean, Sd) UCL	864.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1234
95% Approximate Gamma UCL	533.9		
95% Adjusted Gamma UCL	587.4		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	587.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician

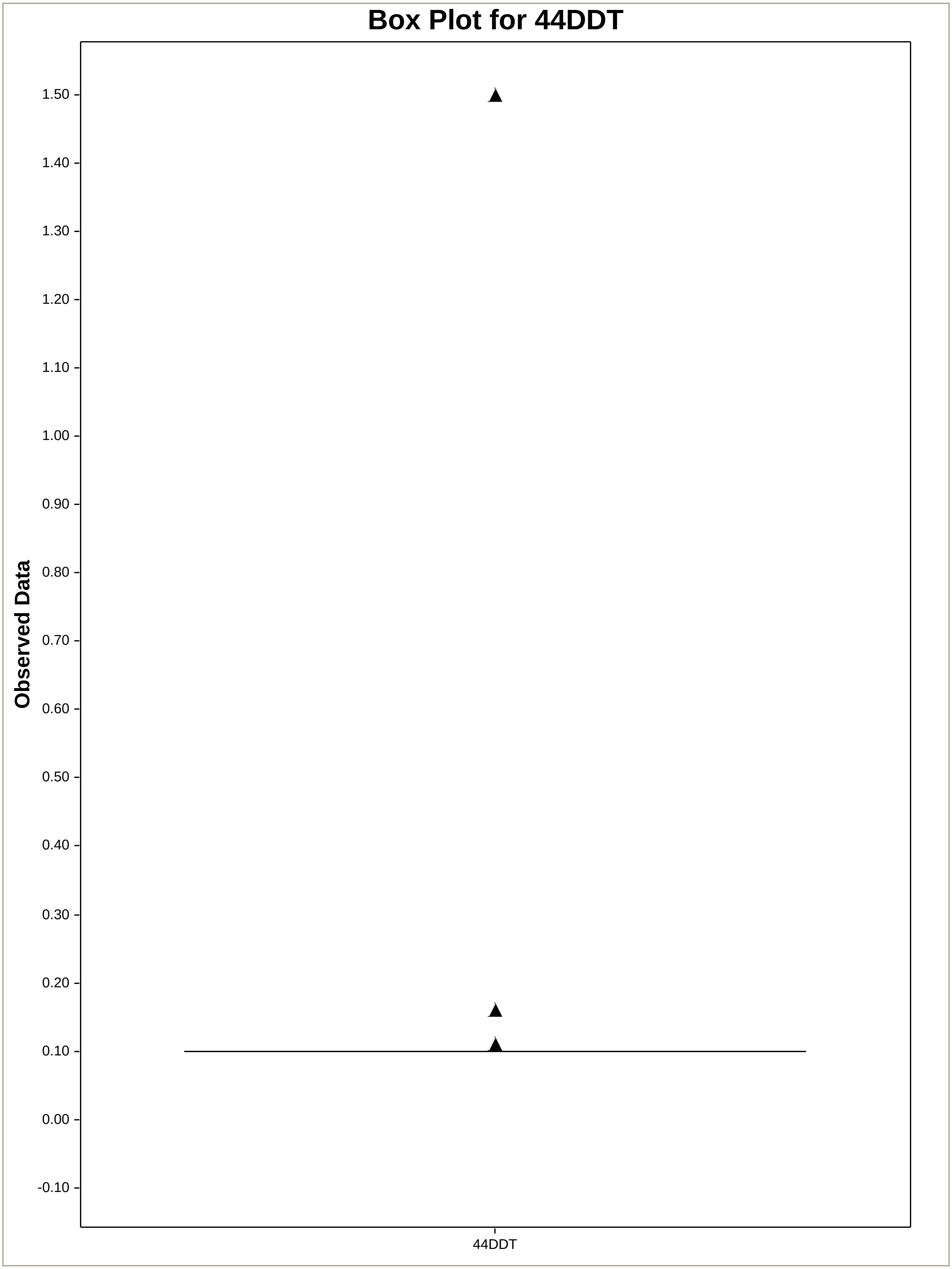
Vanadium

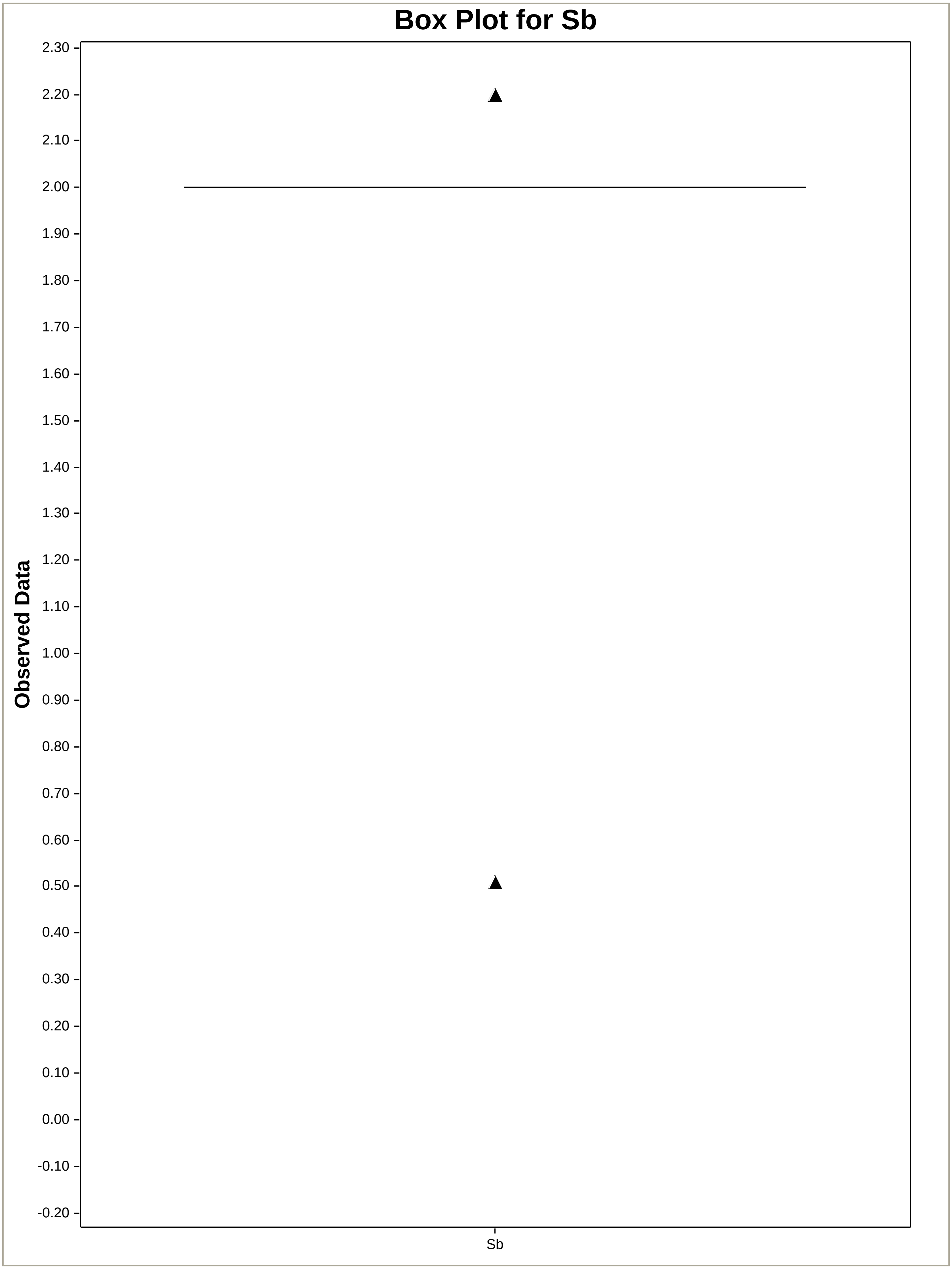
General Statistics - Data are in µg/L.			
Number of Valid Data	16	Number of Detected Data	13
Number of Distinct Detected Data	13	Number of Non-Detect Data	3
		Percent Non-Detects	18.75%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.4	Minimum Detected	0.336
Maximum Detected	20.5	Maximum Detected	3.02
Mean of Detected	6.862	Mean of Detected	1.721
SD of Detected	4.835	SD of Detected	0.682
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Test Statistic	0.966
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.044	Mean	1.57
SD	4.668	SD	0.691
95% DL/2 (t) UCL	8.09	95% H-Stat (DL/2) UCL	9.152
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	5.094	Mean in Log Scale	1.573
SD	5.753	SD in Log Scale	0.697
95% MLE (t) UCL	7.615	Mean in Original Scale	6.065
95% MLE (Tiku) UCL	8.021	SD in Original Scale	4.66
		95% t UCL	8.107
		95% Percentile Bootstrap UCL	8.071
		95% BCA Bootstrap UCL	8.666
		95% H UCL	9.265
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.051	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.346		
nu star	53.32		
A-D Test Statistic	0.313	Nonparametric Statistics	
5% A-D Critical Value	0.741	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.741	Mean	6.081
5% K-S Critical Value	0.239	SD	4.509
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.181
		95% KM (t) UCL	8.152
Assuming Gamma Distribution		95% KM (z) UCL	8.024
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.146
Minimum	1.00E-06	95% KM (bootstrap t) UCL	9.217
Maximum	20.5	95% KM (BCA) UCL	8.438
Mean	5.969	95% KM (Percentile Bootstrap) UCL	8.002
Median	5.55	95% KM (Chebyshev) UCL	11.23
SD	4.789	97.5% KM (Chebyshev) UCL	13.46
k star	0.497	99% KM (Chebyshev) UCL	17.83
Theta star	12.01		
Nu star	15.91	Potential UCLs to Use	
AppChi2	7.899	95% KM (BCA) UCL	8.438
95% Gamma Approximate UCL	12.02		
95% Adjusted Gamma UCL	13.08		
Note: DL/2 is not a recommended method.			

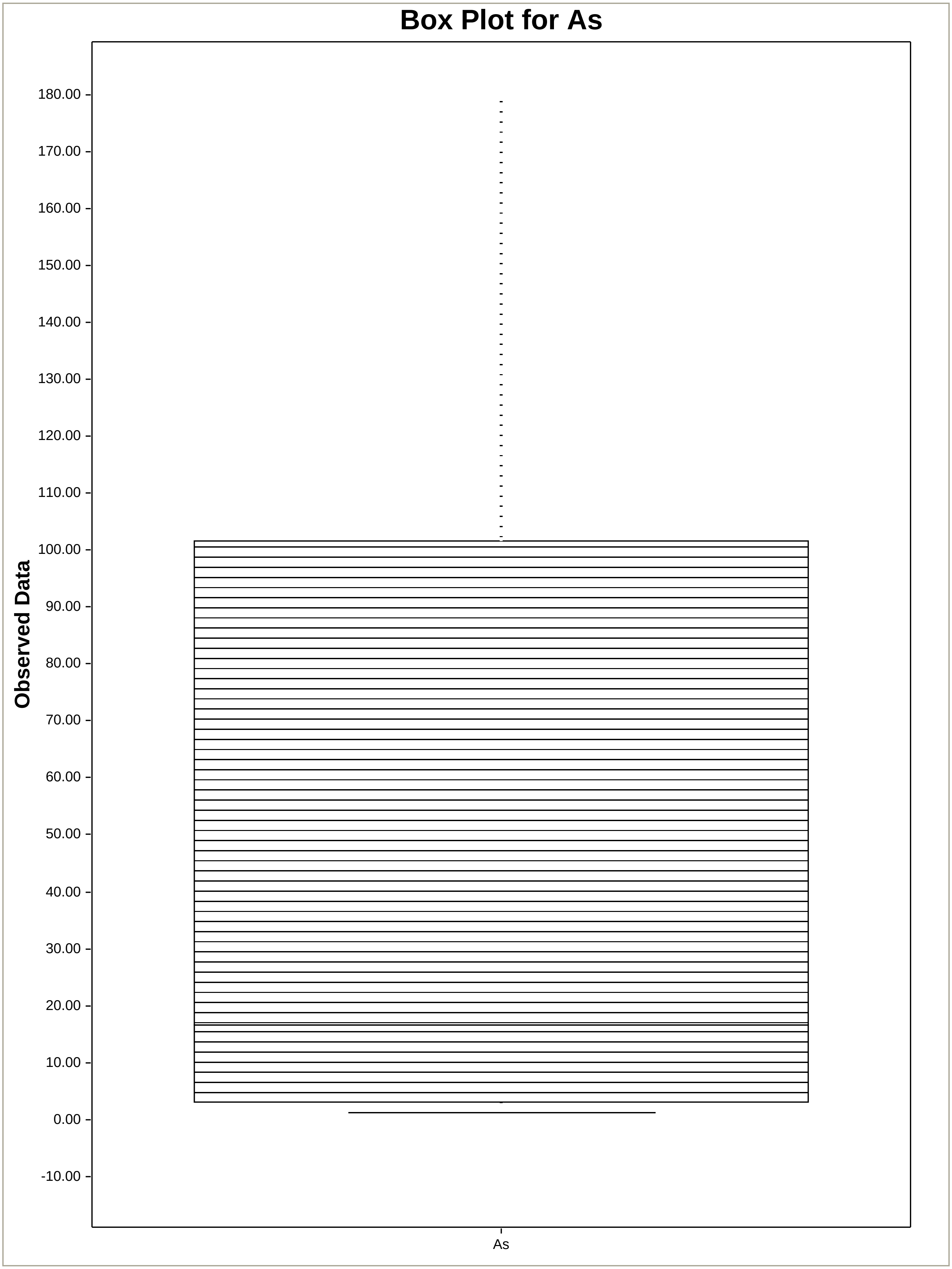
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
For additional insight, the user may want to consult a statistician.



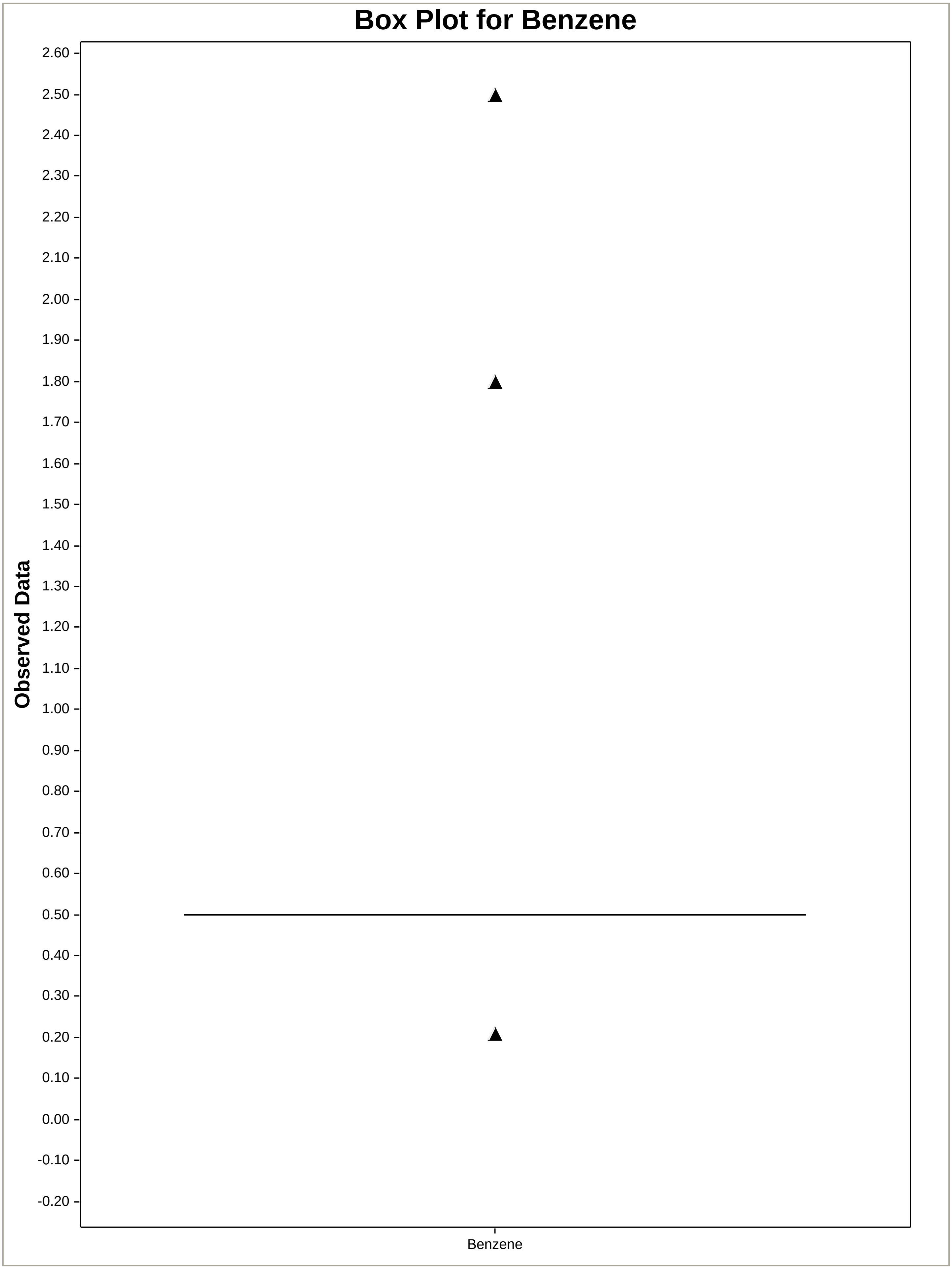
Box Plot for DDD
Observed Data
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
DDD


Box Plot for 44DDT
Observed Data
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
44DDT

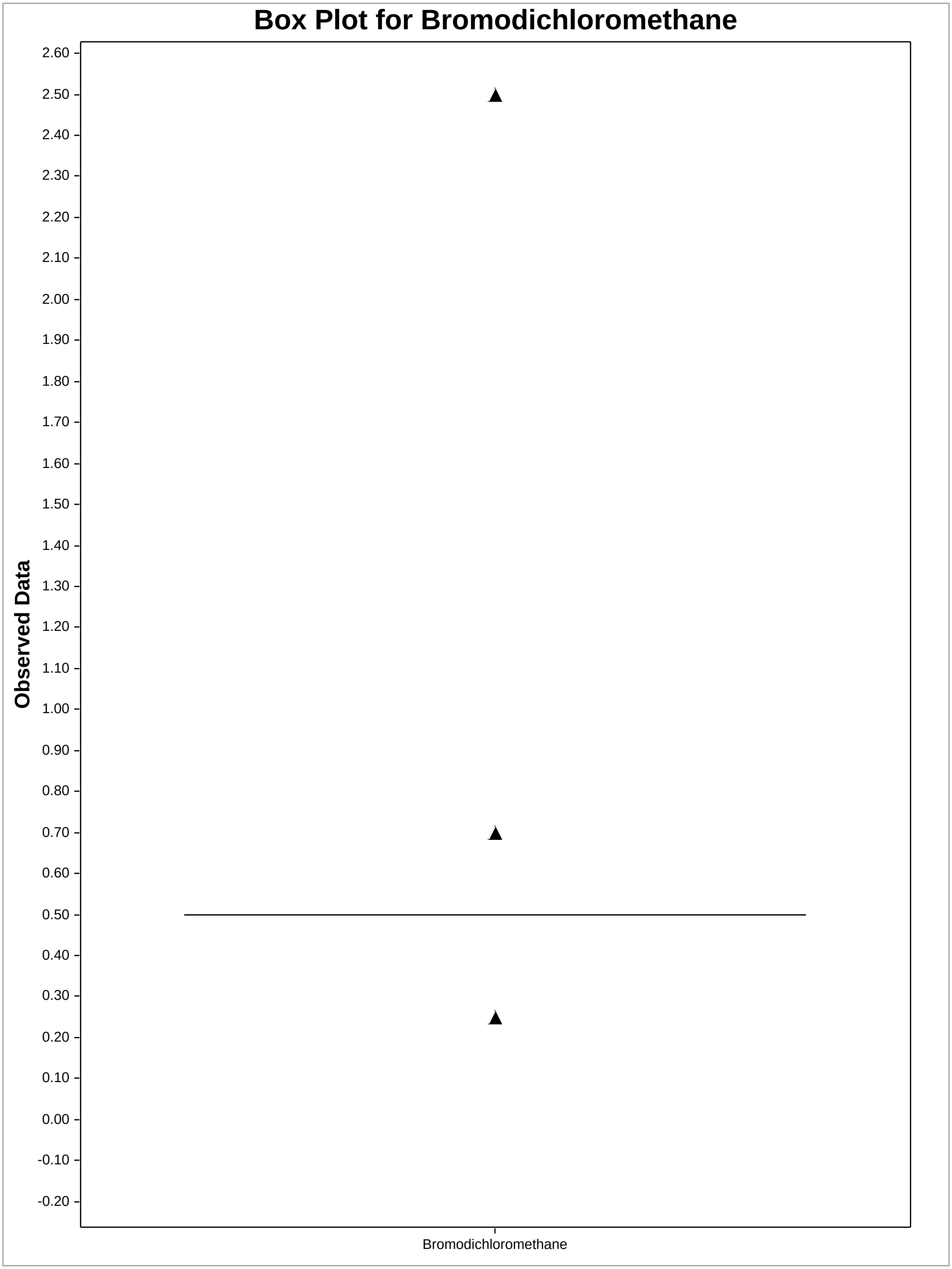

Box Plot for Sb
Observed Data
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Sb

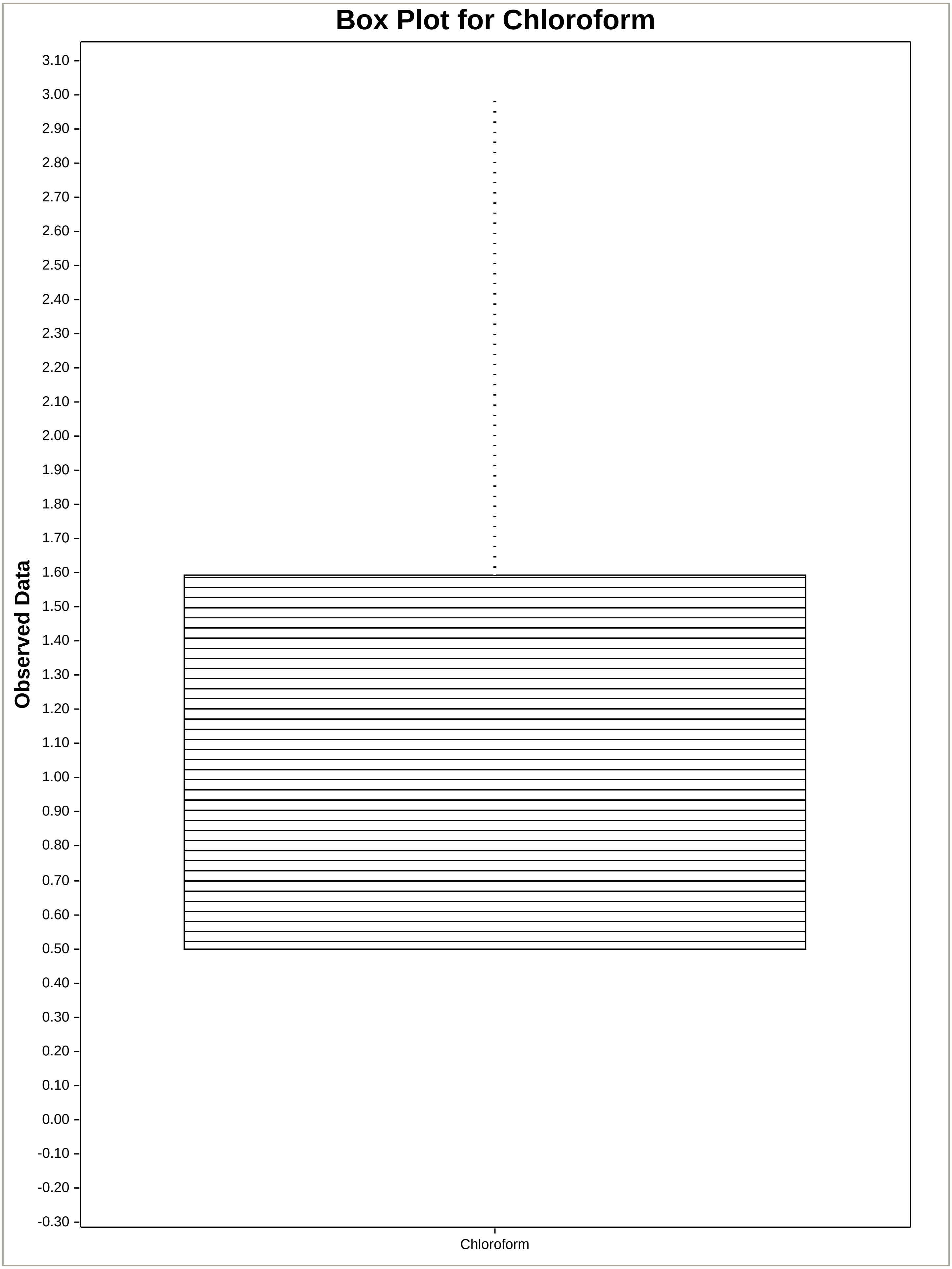


Box Plot for As
Observed Data
180.00
170.00
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
As

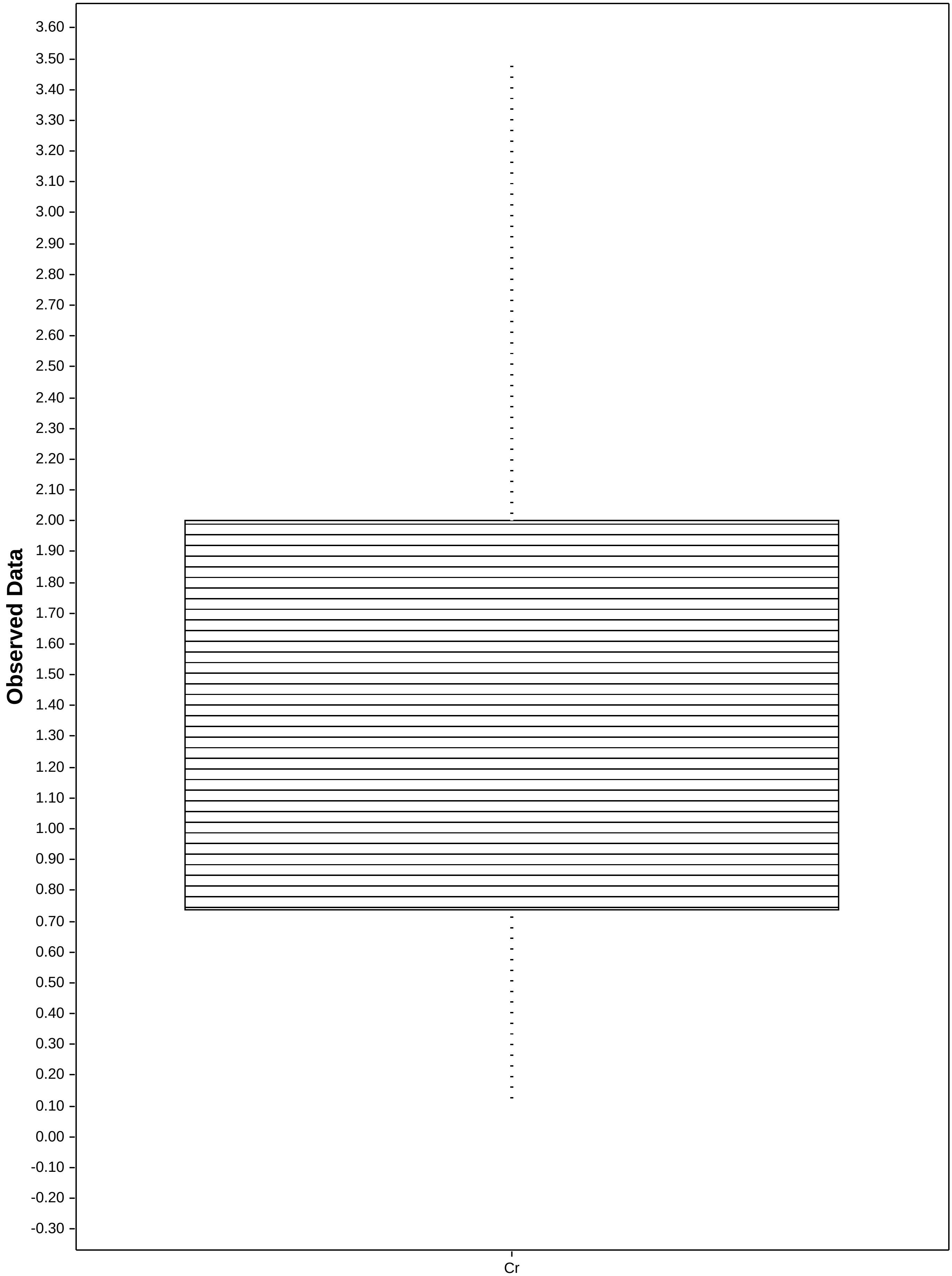


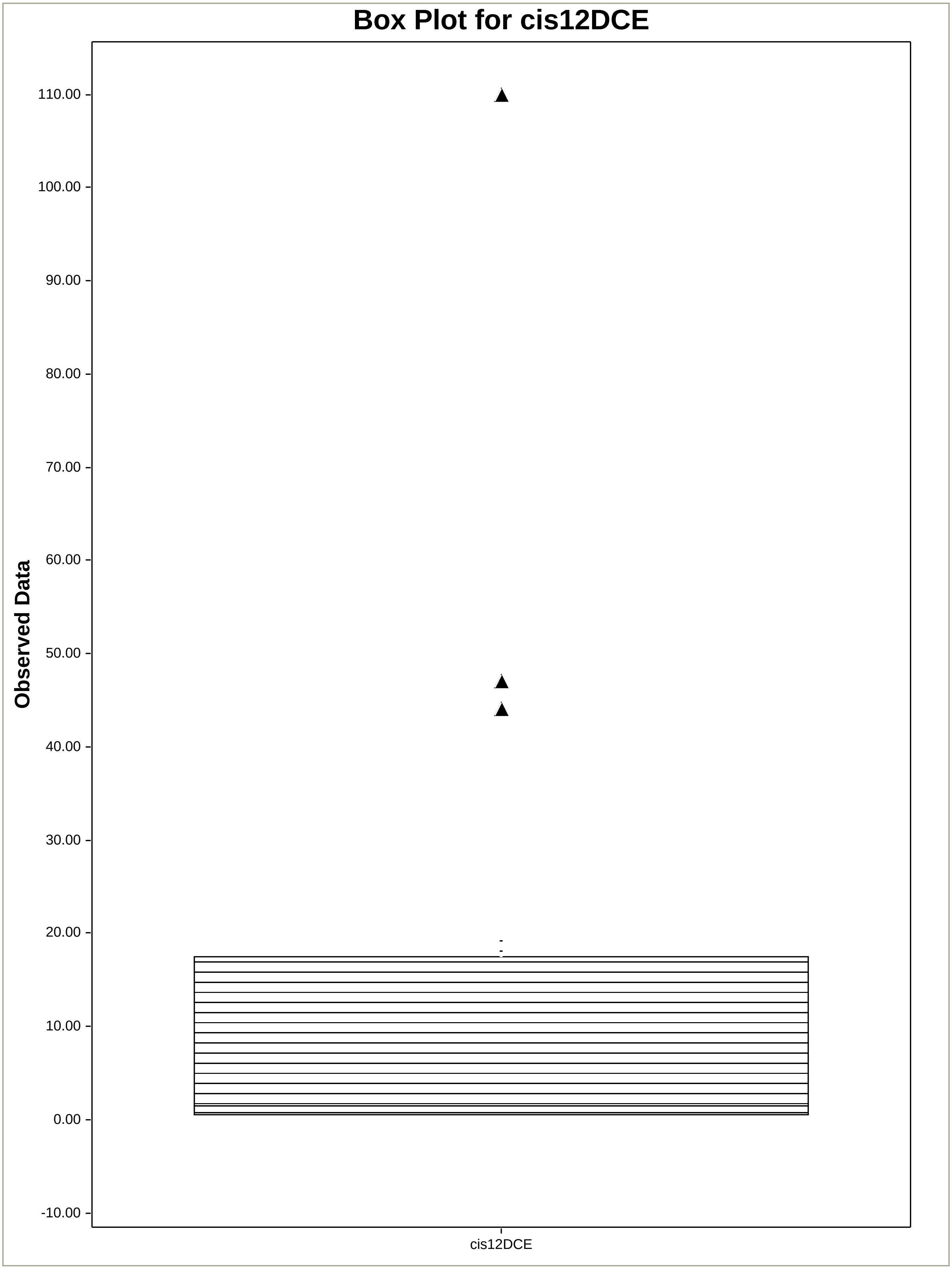
Box Plot for Benzene
Observed Data
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Benzene


Box Plot for Bromodichloromethane
Observed Data
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Bromodichloromethane

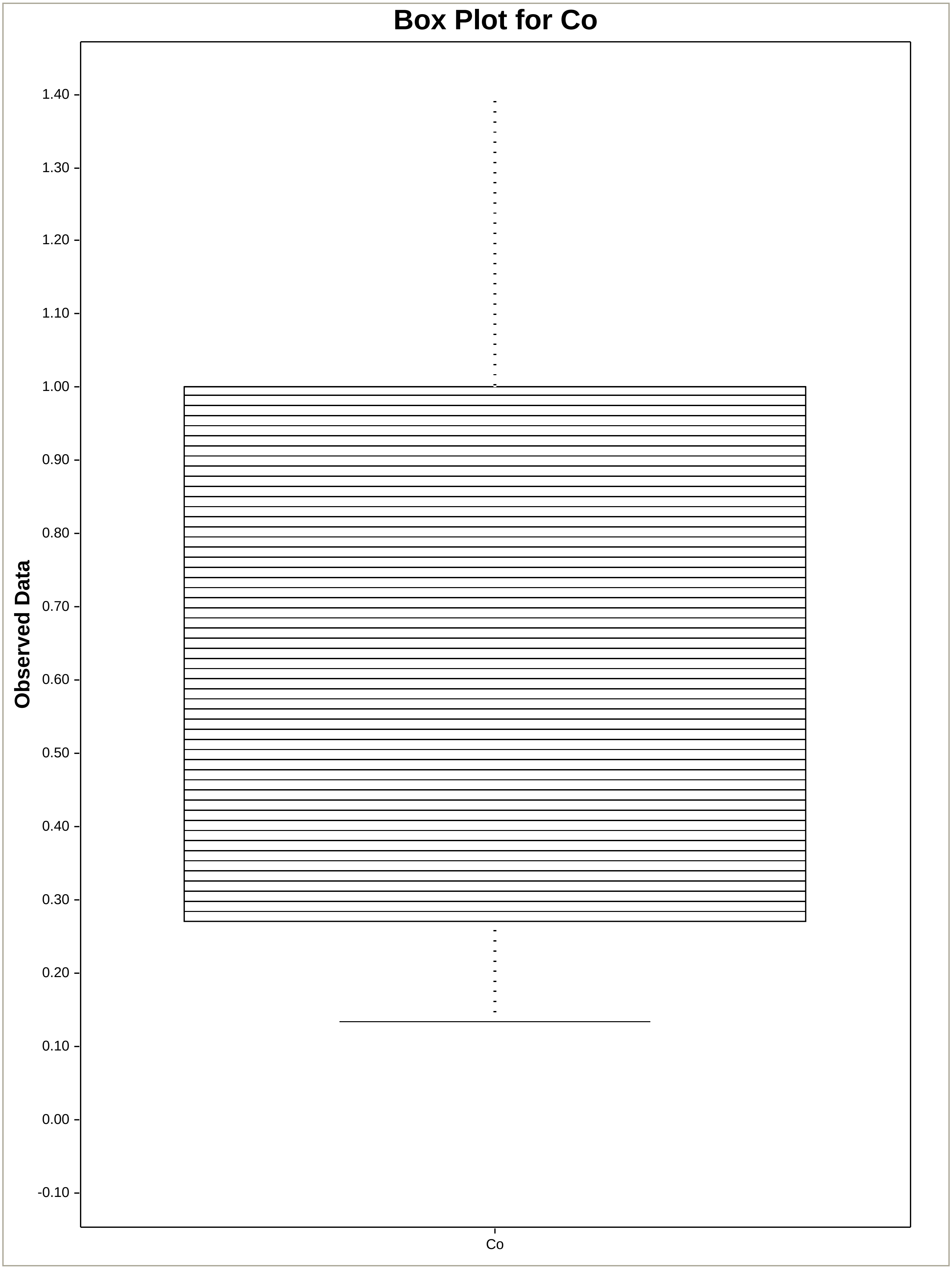

Box Plot for Chloroform
Observed Data
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
Chloroform

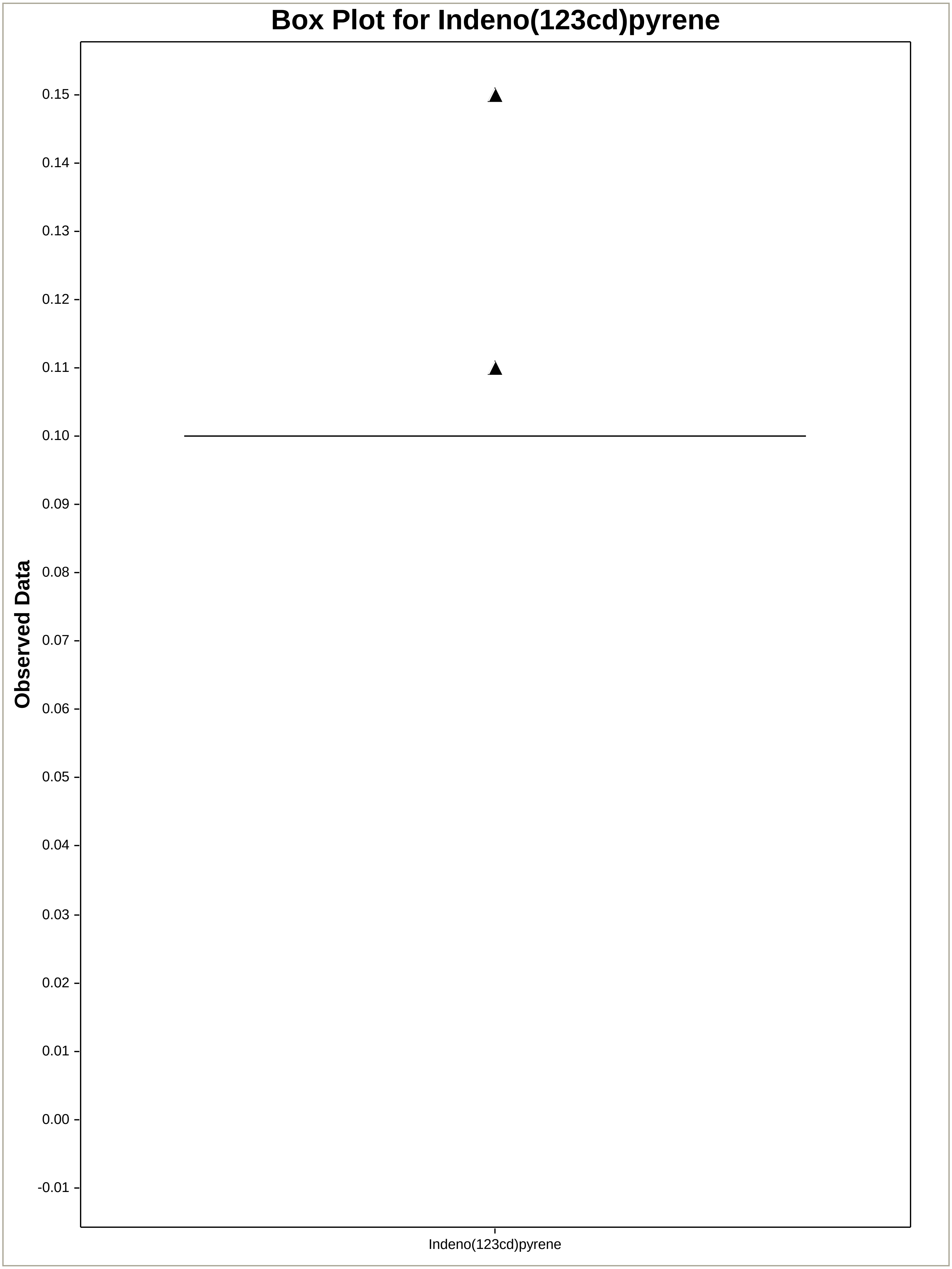
Box Plot for Cr

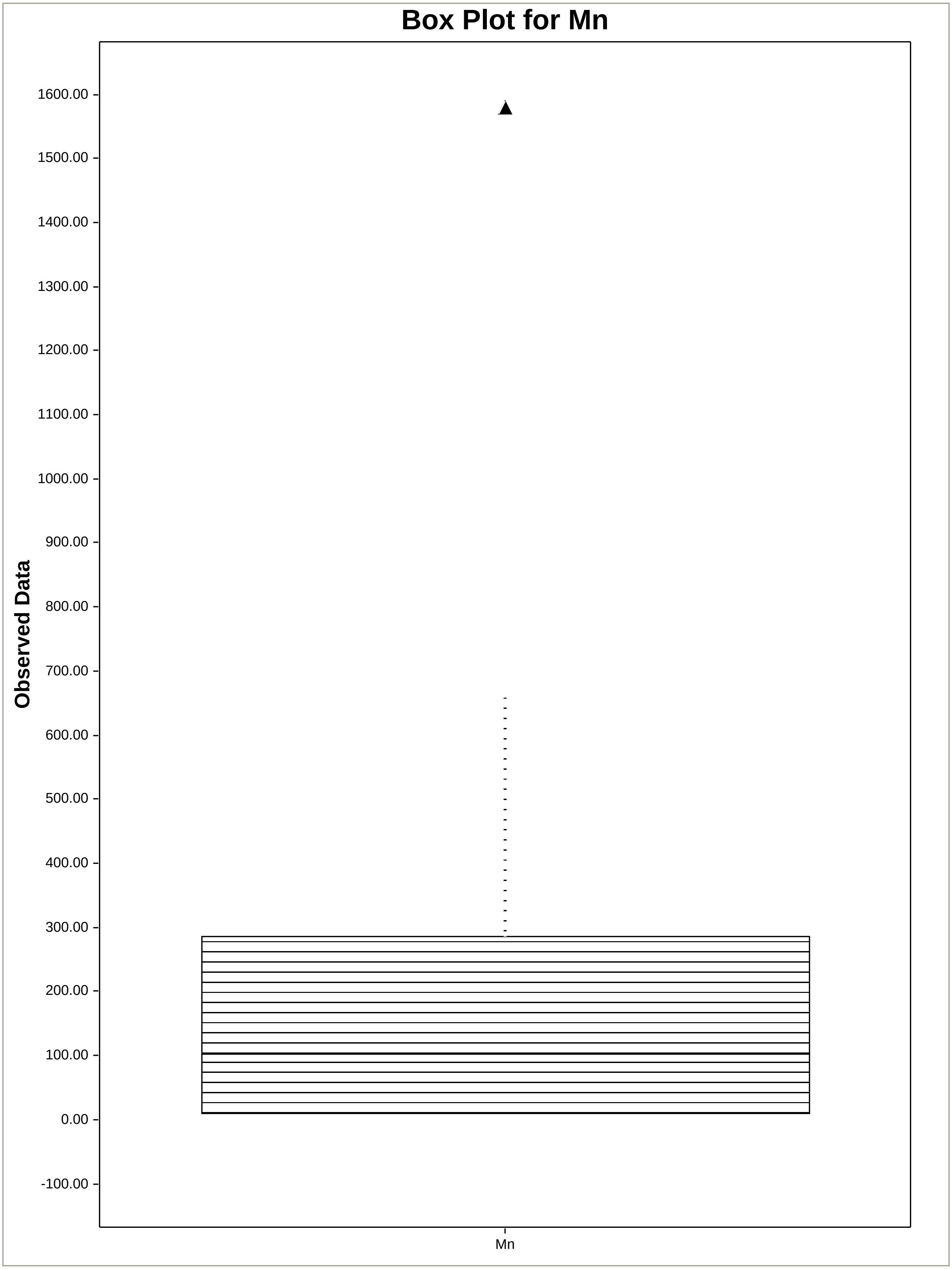


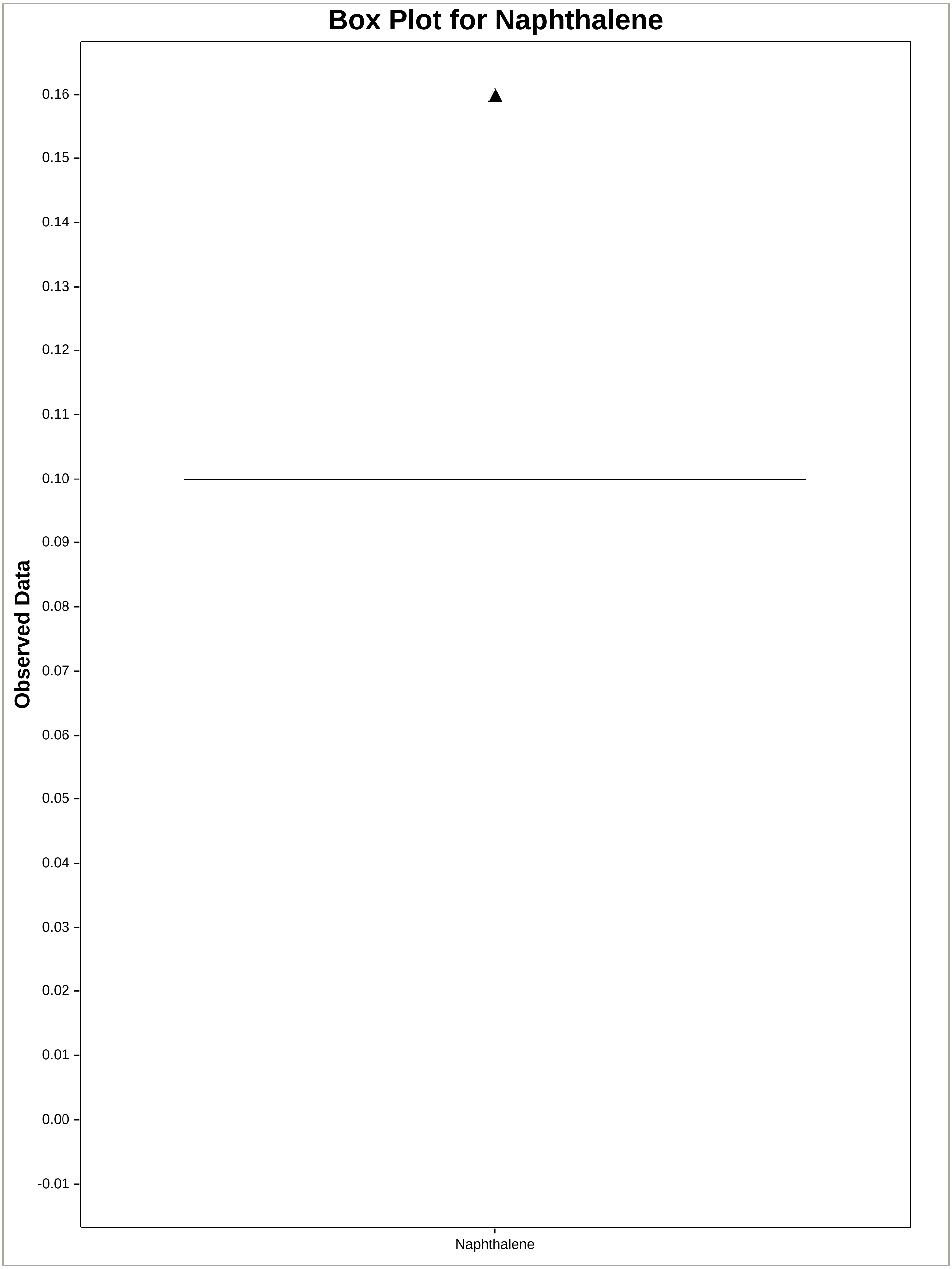


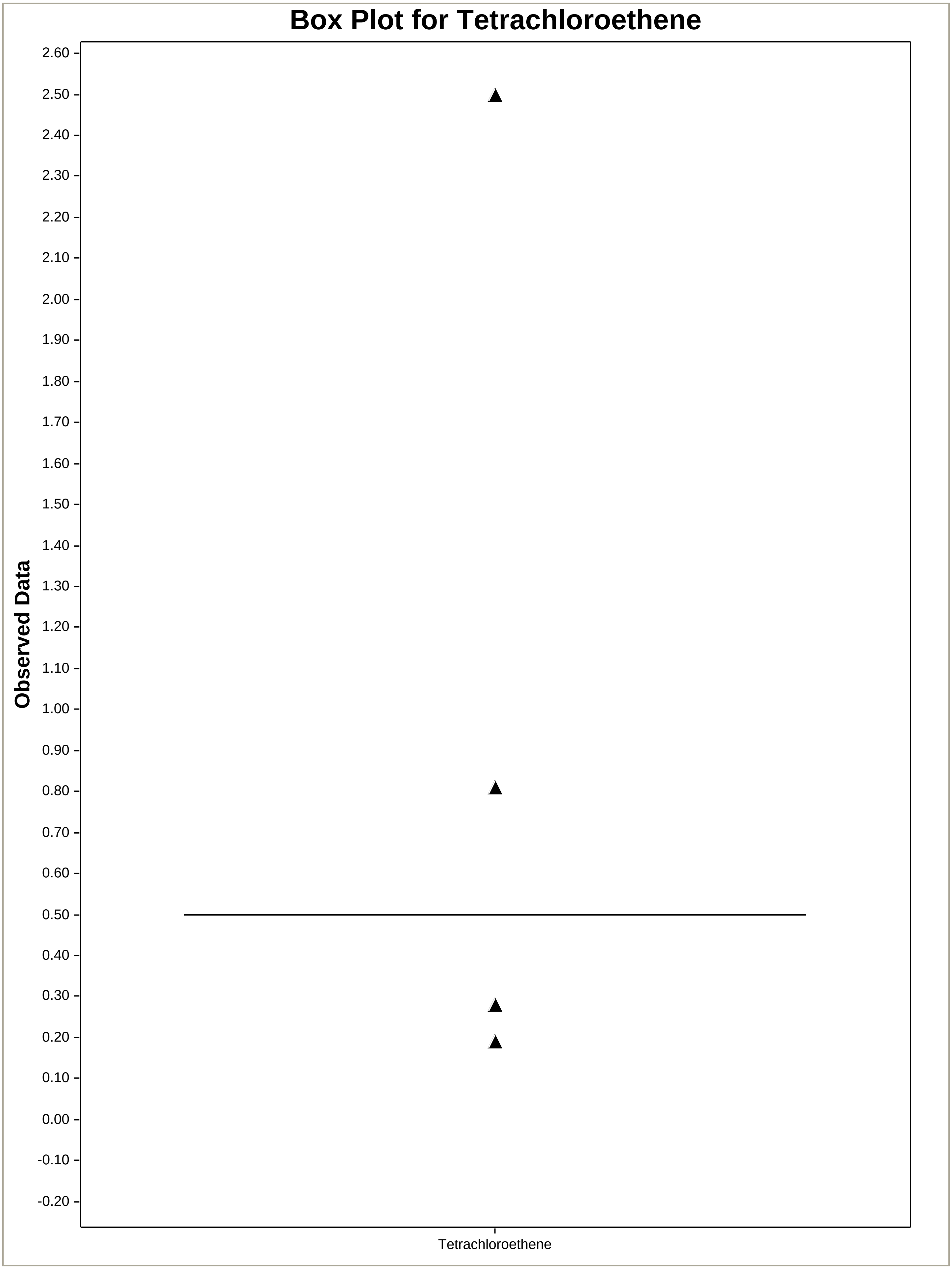
Box Plot for cis12DCE
Observed Data
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
cis12DCE

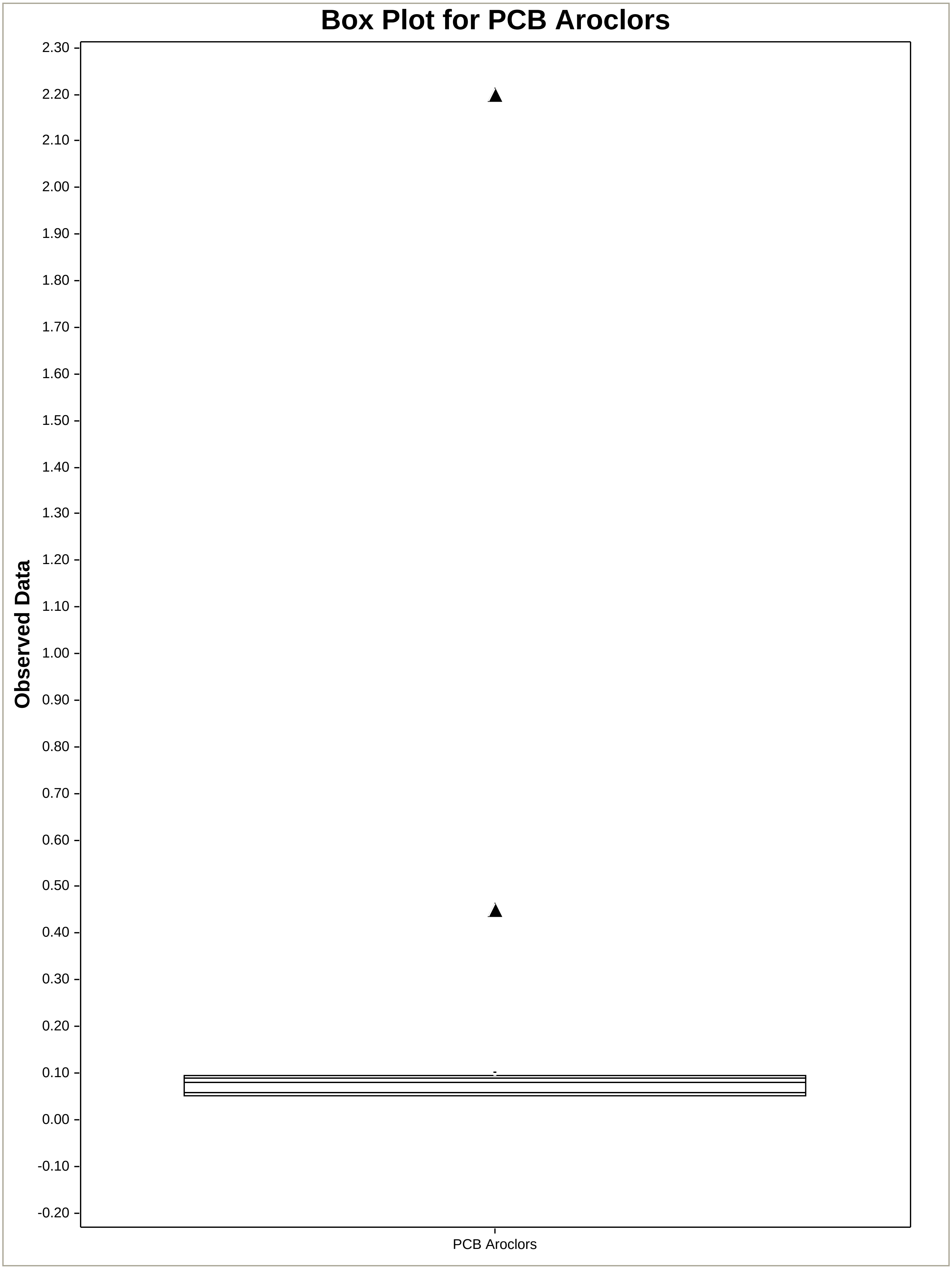

Box Plot for Co
Observed Data
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
Co


Box Plot for Indeno(123cd)pyrene
Observed Data
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
Indeno(123cd)pyrene

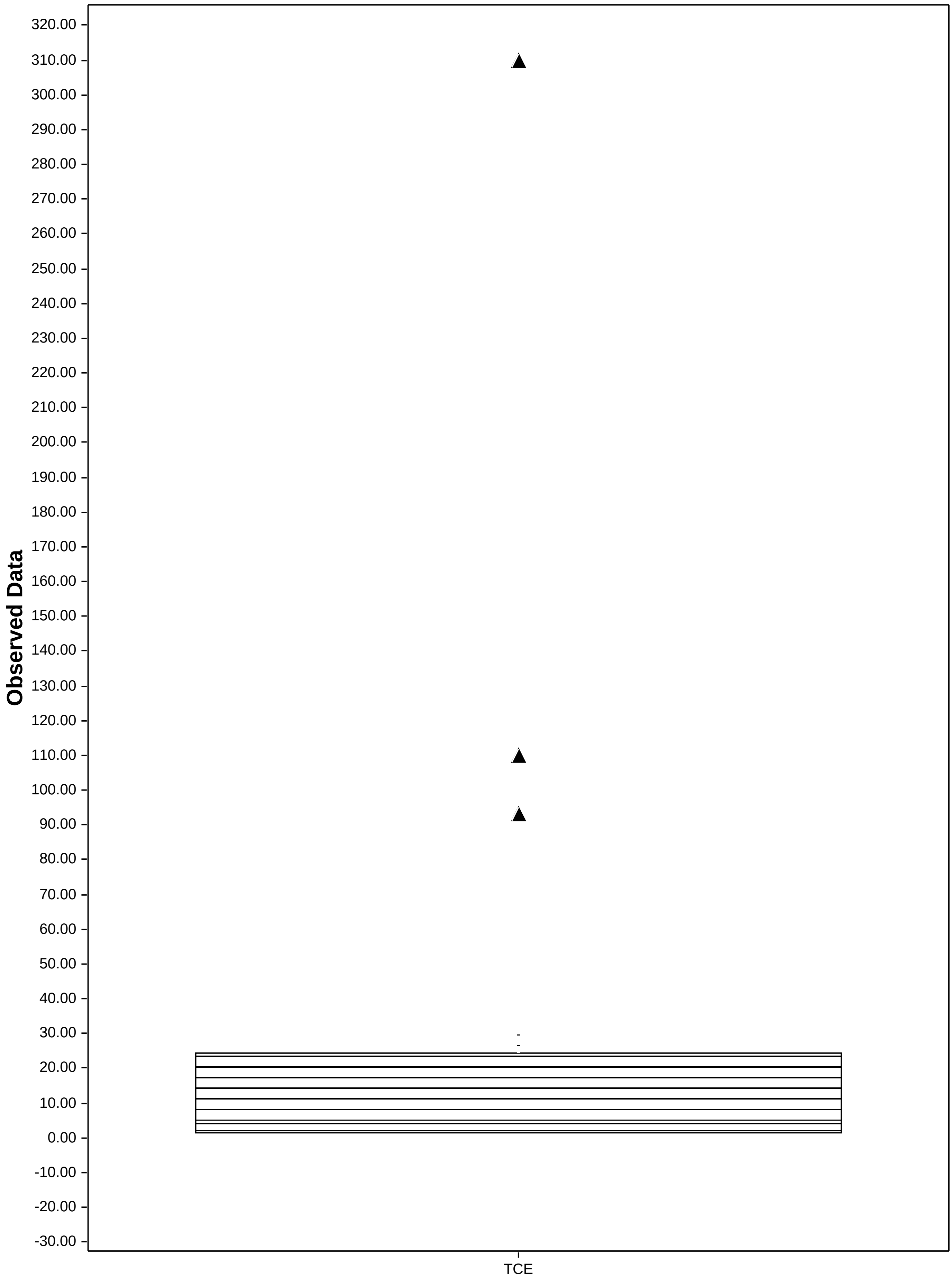

Box Plot for Mn
Observed Data
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
Mn

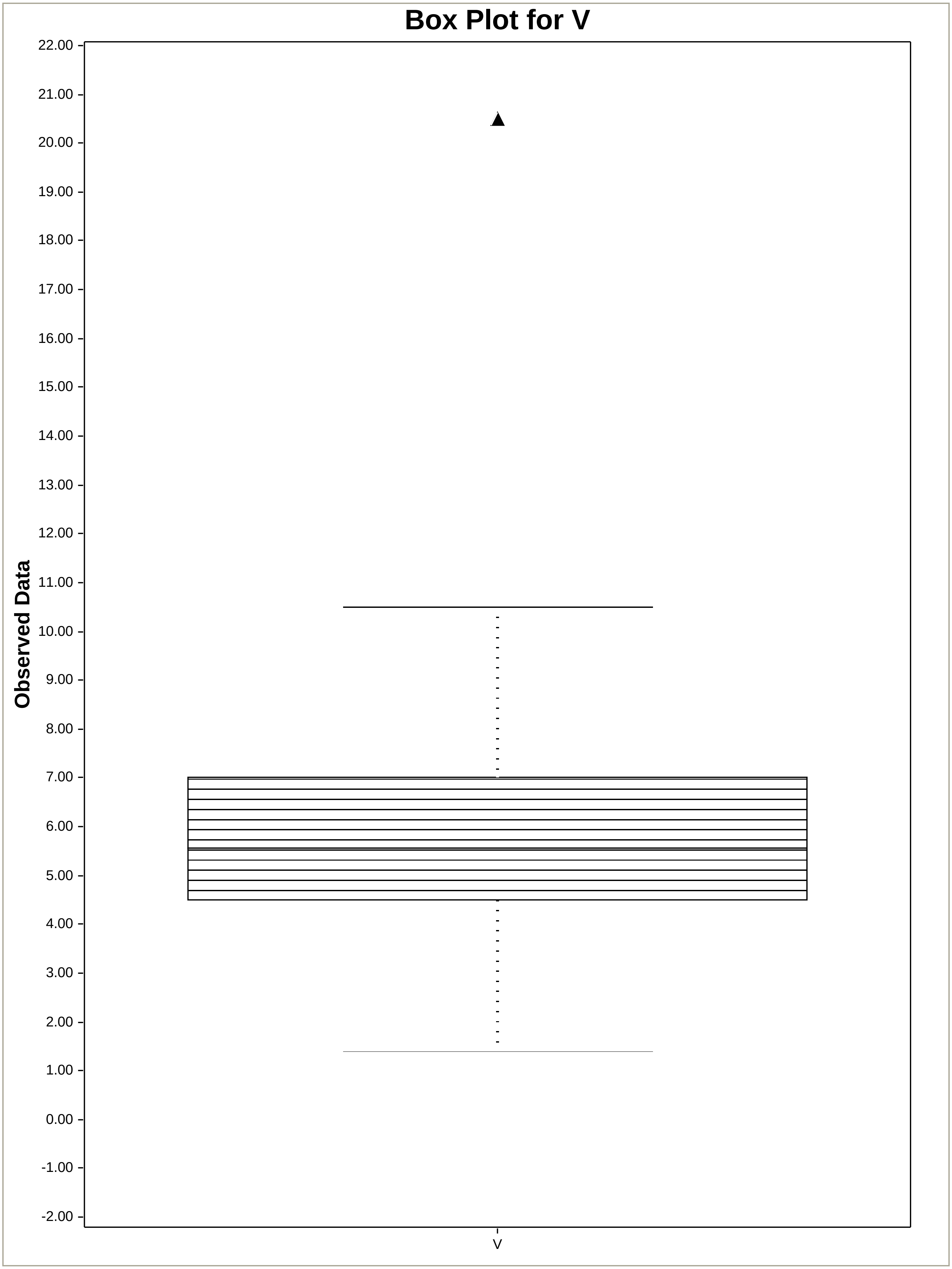

Box Plot for Naphthalene
Observed Data
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
Naphthalene


Box Plot for Tetrachloroethene
Observed Data
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Tetrachloroethene


Box Plot for PCB Aroclors
Observed Data
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
PCB Aroclors

Box Plot for TCE




Box Plot for V
Observed Data
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
V

cis-1,2-Dichloroethene

General Statistics (µg/L)			
Number of Valid Data	8	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	4
		Percent Non-Detects	50.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.36	Minimum Detected	-1.022
Maximum Detected	31	Maximum Detected	3.434
Mean of Detected	14.55	Mean of Detected	1.371
SD of Detected	16.24	SD of Detected	2.307
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.83
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.399	Mean	-0.00763
SD	13.09	SD	2.11
95% DL/2 (t) UCL	16.17	95% H-Stat (DL/2) UCL	1574
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.0809
		SD in Log Scale	2.325
		Mean in Original Scale	7.455
		SD in Original Scale	13.06
		95% t UCL	16.2
		95% Percentile Bootstrap UCL	15.08
		95% BCA Bootstrap UCL	17.57
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.289	Data appear Normal at 5% Significance Level	
Theta Star	50.39		
nu star	2.309		
A-D Test Statistic	0.539	Nonparametric Statistics	
5% A-D Critical Value	0.682	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.682	Mean	7.454
5% K-S Critical Value	0.411	SD	12.22
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	4.987
		95% KM (t) UCL	16.9
Assuming Gamma Distribution		95% KM (z) UCL	15.66
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.07
Minimum	0.36	95% KM (bootstrap t) UCL	13.17
Maximum	62.84	95% KM (BCA) UCL	27.25
Mean	20.37	95% KM (Percentile Bootstrap) UCL	26.63
Median	18.09	95% KM (Chebyshev) UCL	29.19
SD	21.02	97.5% KM (Chebyshev) UCL	38.6
k star	0.505	99% KM (Chebyshev) UCL	57.08
Theta star	40.35		
Nu star	8.076	Potential UCLs to Use	
AppChi2	2.779	95% KM (t) UCL	16.9
95% Gamma Approximate UCL	59.18	95% KM (Percentile Bootstrap) UCL	26.63
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Methyl tert butyl ether

General Statistics (µg/L)			
Number of Valid Data	8	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	4
		Percent Non-Detects	50.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.54	Minimum Detected	-0.616
Maximum Detected	330	Maximum Detected	5.799
Mean of Detected	162.9	Mean of Detected	2.783
SD of Detected	187.2	SD of Detected	3.48
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.745	Shapiro Wilk Test Statistic	0.787
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	81.59	Mean	0.699
SD	150.3	SD	3.187
95% DL/2 (t) UCL	182.2	95% H-Stat (DL/2) UCL	31929975
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.354
		SD in Log Scale	6.29
		Mean in Original Scale	81.47
		SD in Original Scale	150.3
		95% t UCL	182.2
		95% Percentile Bootstrap UCL	163.8
		95% BCA Bootstrap UCL	202.7
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.241	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	675.1		
nu star	1.931		
A-D Test Statistic	0.647	Nonparametric Statistics	
5% A-D Critical Value	0.704	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.704	Mean	81.74
5% K-S Critical Value	0.418	SD	140.5
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	57.35
		95% KM (t) UCL	190.4
Assuming Gamma Distribution		95% KM (z) UCL	176.1
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	182.1
Minimum	0.54	95% KM (bootstrap t) UCL	138.3
Maximum	377.3	95% KM (BCA) UCL	322.5
Mean	162.9	95% KM (Percentile Bootstrap) UCL	321.3
Median	110.7	95% KM (Chebyshev) UCL	331.7
SD	156.7	97.5% KM (Chebyshev) UCL	439.9
k star	0.389	99% KM (Chebyshev) UCL	652.3
Theta star	419.1		
Nu star	6.22	Potential UCLs to Use	
AppChi2	1.753	95% KM (t) UCL	190.4
95% Gamma Approximate UCL	578		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics (µg/L)			
Number of Valid Data	8	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	6
		Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	620	Minimum Detected	6.43
Maximum Detected	1800	Maximum Detected	7.496
Mean of Detected	1210	Mean of Detected	6.963
SD of Detected	834.4	SD of Detected	0.754
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	302.7	Mean	0.701
SD	642.7	SD	3.875
95% DL/2 (t) UCL	733.2	95% H-Stat (DL/2) UCL	8.24E+10
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	767.5
5% K-S Critical Value	N/A	SD	390.2
Data not Gamma Distributed at 5% Significance Level		SE of Mean	195.1
		95% KM (t) UCL	1137
Assuming Gamma Distribution		95% KM (z) UCL	1088
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	1618
SD	N/A	97.5% KM (Chebyshev) UCL	1986
k star	N/A	99% KM (Chebyshev) UCL	2709
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	1137
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics (µg/L)			
Number of Valid Data	8	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	6
		Percent Non-Detects	75.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.084	Minimum Detected	-2.477
Maximum Detected	0.18	Maximum Detected	-1.715
Mean of Detected	0.132	Mean of Detected	-2.096
SD of Detected	0.0679	SD of Detected	0.539
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0705	Mean	-2.771
SD	0.0458	SD	0.464
95% DL/2 (t) UCL	0.101	95% H-Stat (DL/2) UCL	0.104
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.096
5% K-S Critical Value	N/A	SD	0.0317
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0159
		95% KM (t) UCL	0.126
Assuming Gamma Distribution		95% KM (z) UCL	0.122
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.165
SD	N/A	97.5% KM (Chebyshev) UCL	0.195
k star	N/A	99% KM (Chebyshev) UCL	0.254
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.126
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics (µg/L)			
Number of Valid Observations	8	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.85	Minimum of Log Data	-0.163
Maximum	68.8	Maximum of Log Data	4.231
Mean	13.49	Mean of log Data	1.805
Median	6.1	SD of log Data	1.277
SD	22.61		
Coefficient of Variation	1.675		
Skewness	2.702		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.562	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	28.64	95% H-UCL	101.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	35.52
95% Adjusted-CLT UCL (Chen-1995)	34.8	97.5% Chebyshev (MVUE) UCL	45.76
95% Modified-t UCL (Johnson-1978)	29.91	99% Chebyshev (MVUE) UCL	65.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.553	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	24.42		
MLE of Mean	13.49		
MLE of Standard Deviation	18.15		
nu star	8.843		
Approximate Chi Square Value (.05)	3.232	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	26.64
Adjusted Chi Square Value	2.436	95% Jackknife UCL	28.64
		95% Standard Bootstrap UCL	25.56
Anderson-Darling Test Statistic	0.667	95% Bootstrap-t UCL	97.58
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	97.81
Kolmogorov-Smirnov Test Statistic	0.282	95% Percentile Bootstrap UCL	28.37
Kolmogorov-Smirnov 5% Critical Value	0.304	95% BCA Bootstrap UCL	36.96
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48.34
		97.5% Chebyshev(Mean, Sd) UCL	63.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	93.03
95% Approximate Gamma UCL	36.92		
95% Adjusted Gamma UCL	48.98		
Potential UCL to Use		Use 95% Approximate Gamma UCL	36.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics (µg/L)			
Number of Valid Observations	8	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	158	Minimum of Log Data	5.063
Maximum	8790	Maximum of Log Data	9.081
Mean	2609	Mean of log Data	6.921
Median	858.5	SD of log Data	1.495
SD	3687		
Coefficient of Variation	1.413		
Skewness	1.416		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.643	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5079	95% H-UCL	44707
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8195
95% Adjusted-CLT UCL (Chen-1995)	5451	97.5% Chebyshev (MVUE) UCL	10672
95% Modified-t UCL (Johnson-1978)	5188	99% Chebyshev (MVUE) UCL	15539
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.487	Data appear Lognormal at 5% Significance Level	
Theta Star	5356		
MLE of Mean	2609		
MLE of Standard Deviation	3738		
nu star	7.795		
Approximate Chi Square Value (.05)	2.617	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	4753
Adjusted Chi Square Value	1.922	95% Jackknife UCL	5079
		95% Standard Bootstrap UCL	4623
Anderson-Darling Test Statistic	0.863	95% Bootstrap-t UCL	24339
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	38899
Kolmogorov-Smirnov Test Statistic	0.362	95% Percentile Bootstrap UCL	4658
Kolmogorov-Smirnov 5% Critical Value	0.306	95% BCA Bootstrap UCL	4840
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8292
		97.5% Chebyshev(Mean, Sd) UCL	10750
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15580
95% Approximate Gamma UCL	7772		
95% Adjusted Gamma UCL	10583		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8292

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics (µg/L)			
Number of Valid Data	8	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	6
		Percent Non-Detects	75.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.45	Minimum Detected	-0.799
Maximum Detected	0.57	Maximum Detected	-0.562
Mean of Detected	0.51	Mean of Detected	-0.68
SD of Detected	0.0849	SD of Detected	0.167
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	4	Maximum Non-Detect	1.386
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.003	Mean	-0.0834
SD	0.461	SD	0.444
95% DL/2 (t) UCL	1.311	95% H-Stat (DL/2) UCL	1.483
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.51
5% K-S Critical Value	N/A	SD	0.06
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.06
		95% KM (t) UCL	0.624
Assuming Gamma Distribution		95% KM (z) UCL	0.609
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.66
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	0.57
Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.57
Median	N/A	95% KM (Chebyshev) UCL	0.772
SD	N/A	97.5% KM (Chebyshev) UCL	0.885
k star	N/A	99% KM (Chebyshev) UCL	1.107
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.624
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	0.57
95% Adjusted Gamma UCL	N/A		

Warning: Recommended UCL exceeds the maximum observation
Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Manganese

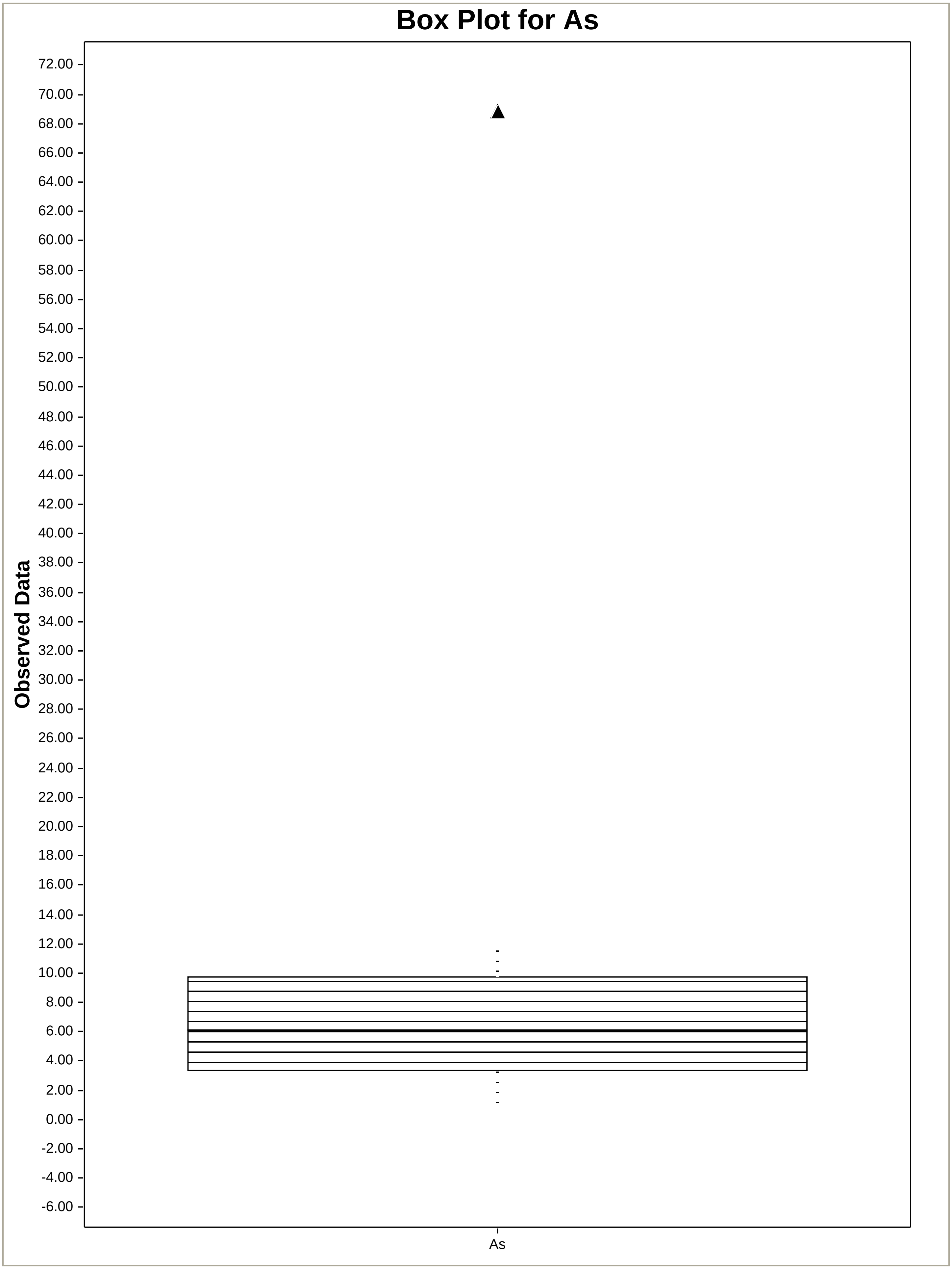
General Statistics (µg/L)			
Number of Valid Observations	8	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	34.9	Minimum of Log Data	3.552
Maximum	484	Maximum of Log Data	6.182
Mean	213	Mean of log Data	5.045
Median	154	SD of log Data	0.909
SD	165.8		
Coefficient of Variation	0.778		
Skewness	0.794		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

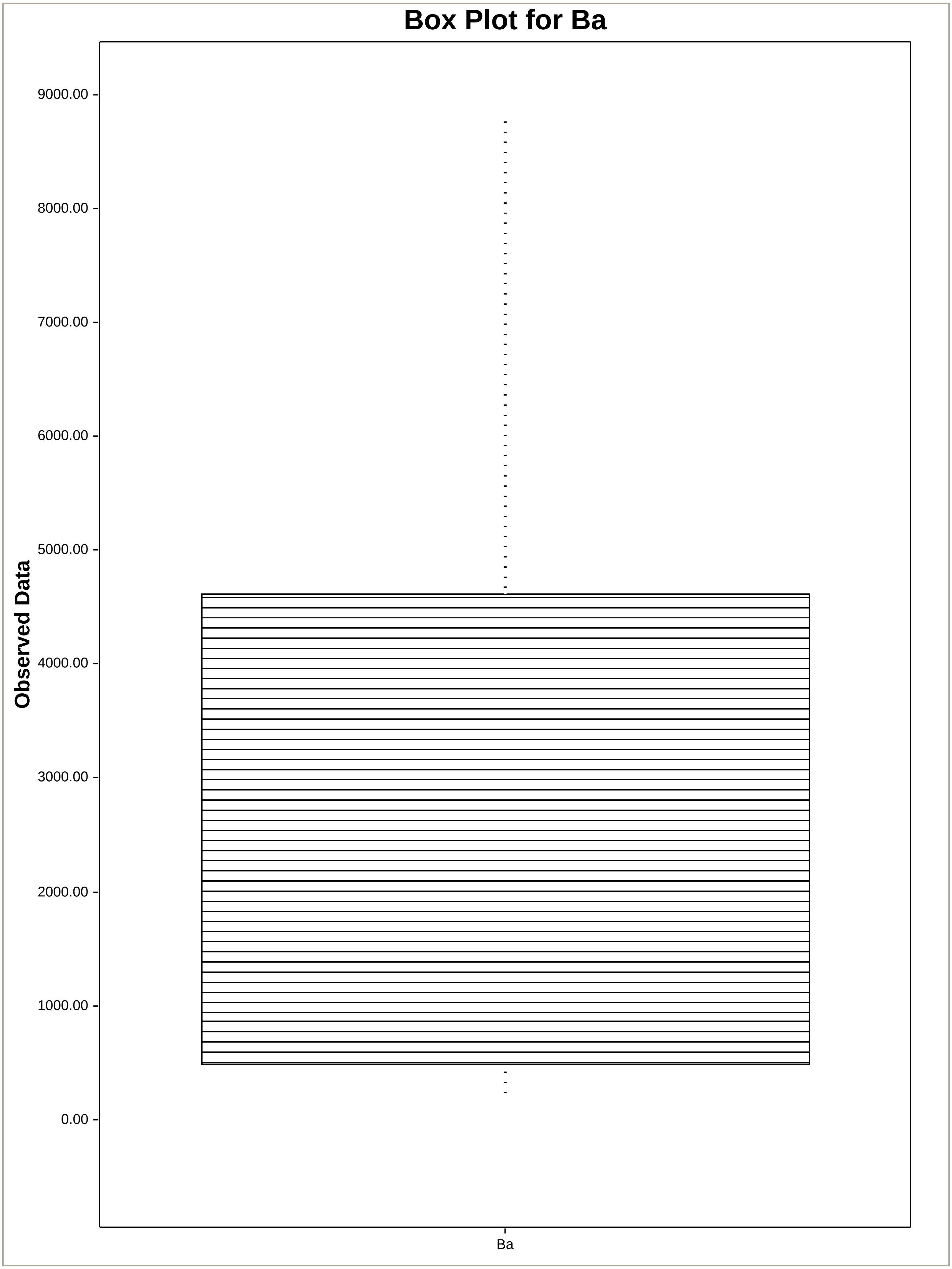
The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.896	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	324.1	95% H-UCL	706.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	534.2
95% Adjusted-CLT UCL (Chen-1995)	327	97.5% Chebyshev (MVUE) UCL	670.3
95% Modified-t UCL (Johnson-1978)	326.8	99% Chebyshev (MVUE) UCL	937.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.163	Data appear Normal at 5% Significance Level	
Theta Star	183.2		
MLE of Mean	213		
MLE of Standard Deviation	197.6		
nu star	18.6		
Approximate Chi Square Value (.05)	9.826	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	309.4
Adjusted Chi Square Value	8.263	95% Jackknife UCL	324.1
		95% Standard Bootstrap UCL	303.2
Anderson-Darling Test Statistic	0.209	95% Bootstrap-t UCL	391.9
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	361
Kolmogorov-Smirnov Test Statistic	0.147	95% Percentile Bootstrap UCL	305.9
Kolmogorov-Smirnov 5% Critical Value	0.298	95% BCA Bootstrap UCL	315
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	468.5
		97.5% Chebyshev(Mean, Sd) UCL	579
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	796.1
95% Approximate Gamma UCL	403.2		
95% Adjusted Gamma UCL	479.5		
Potential UCL to Use		Use 95% Student's-t UCL	324.1

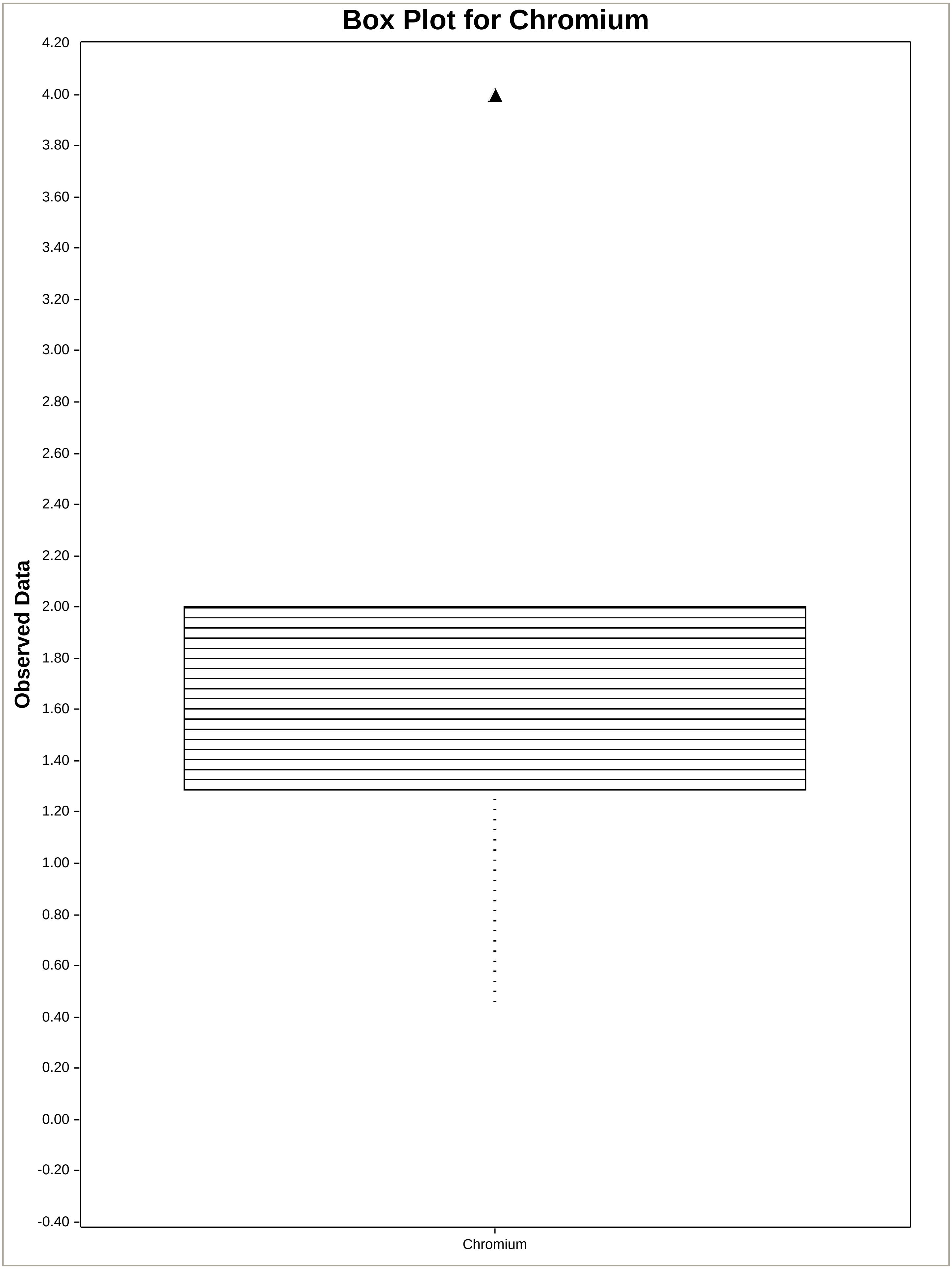
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

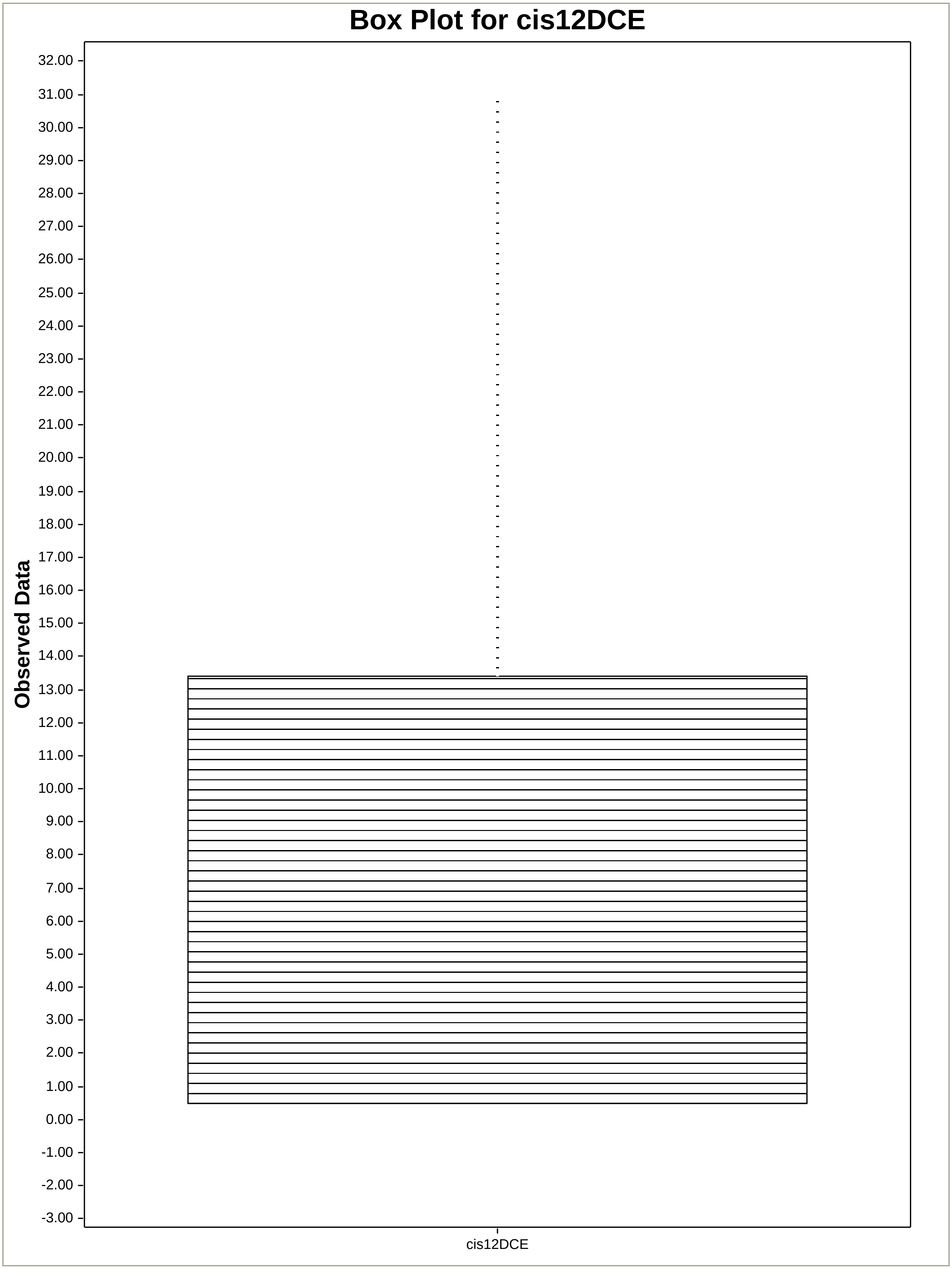


Box Plot for As
Observed Data
72.00
70.00
68.00
66.00
64.00
62.00
60.00
58.00
56.00
54.00
52.00
50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
As

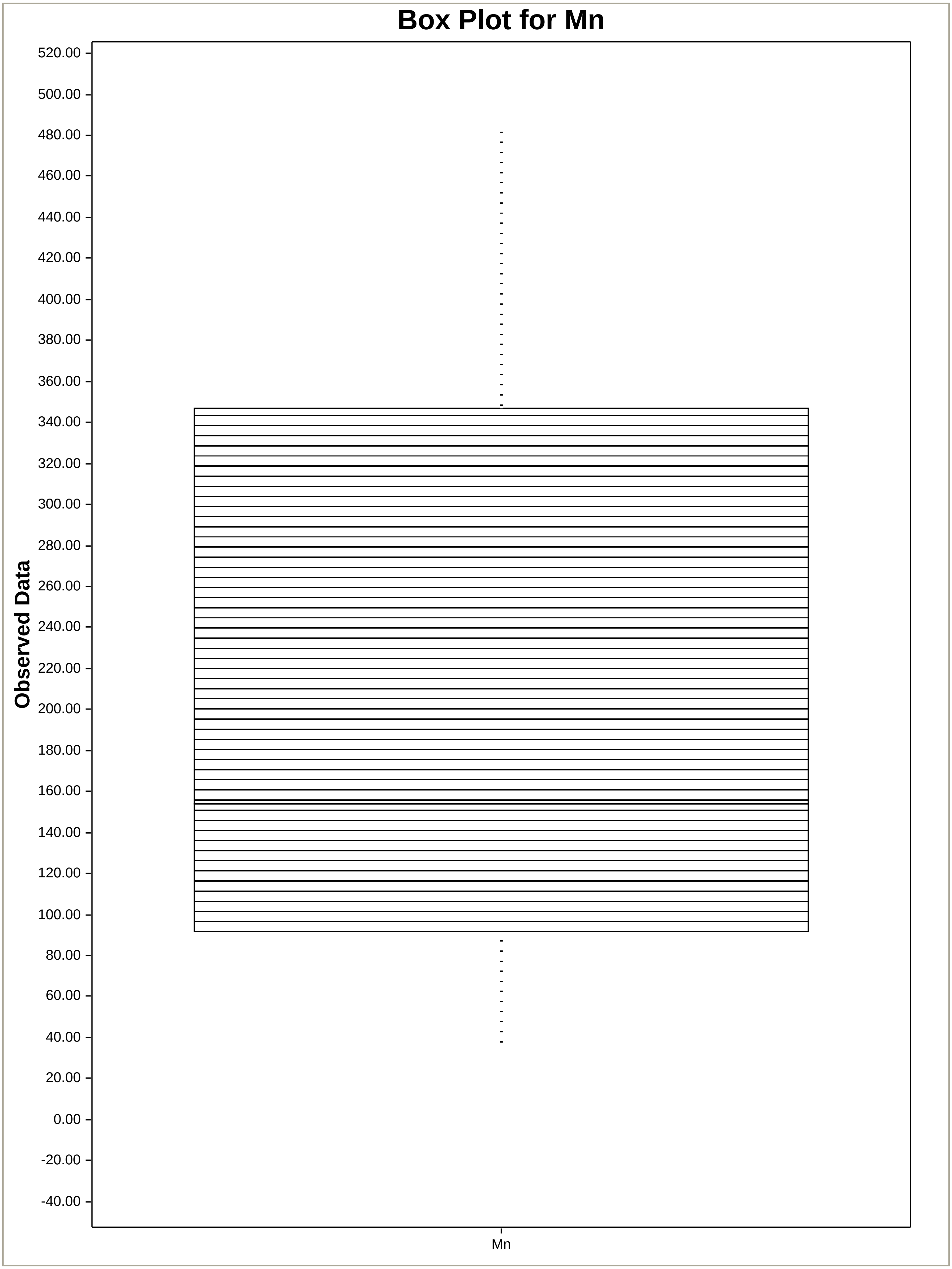


Box Plot for Ba
Observed Data
9000.00
8000.00
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
Ba

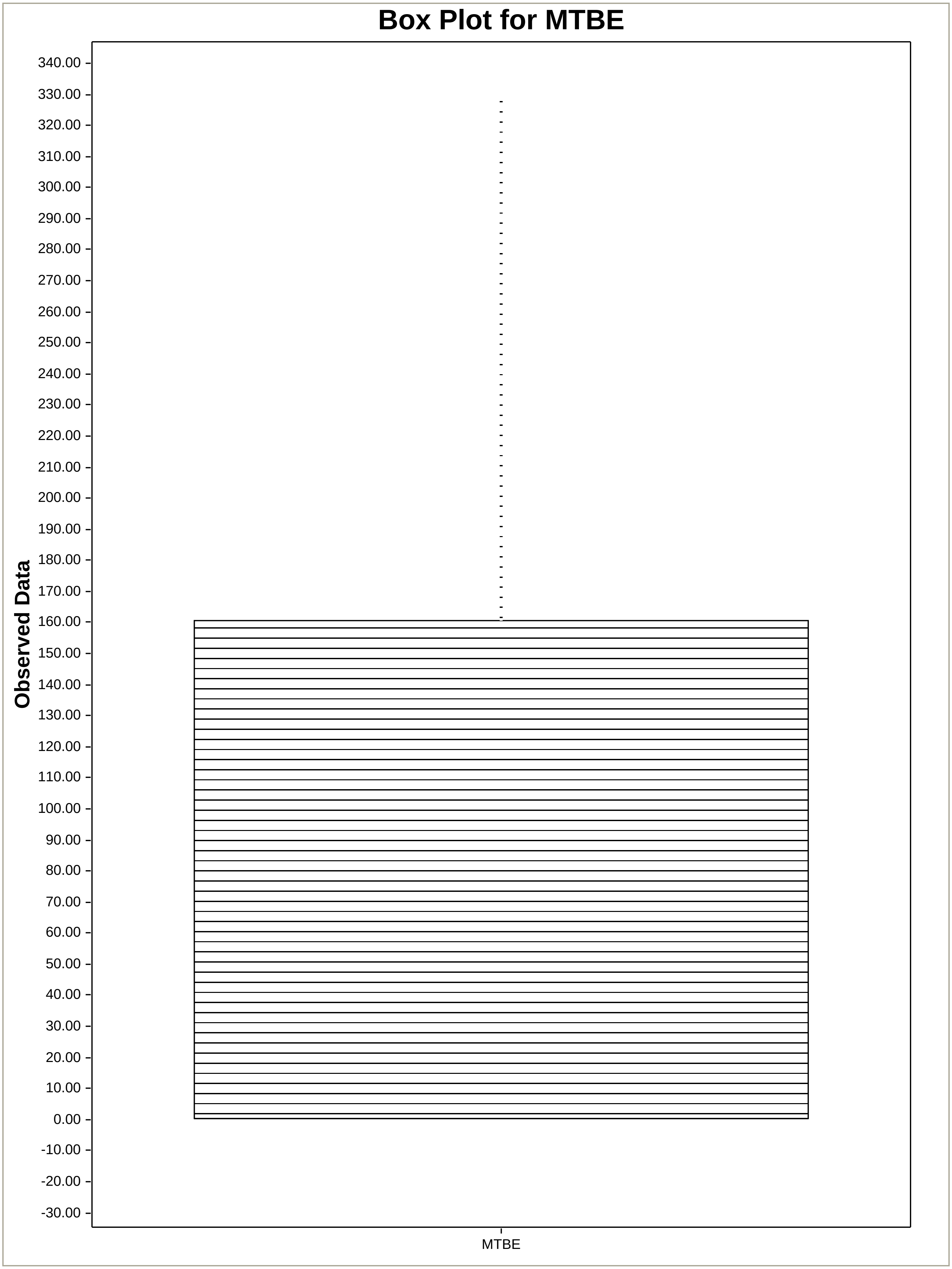

Box Plot for Chromium
Observed Data
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
Chromium

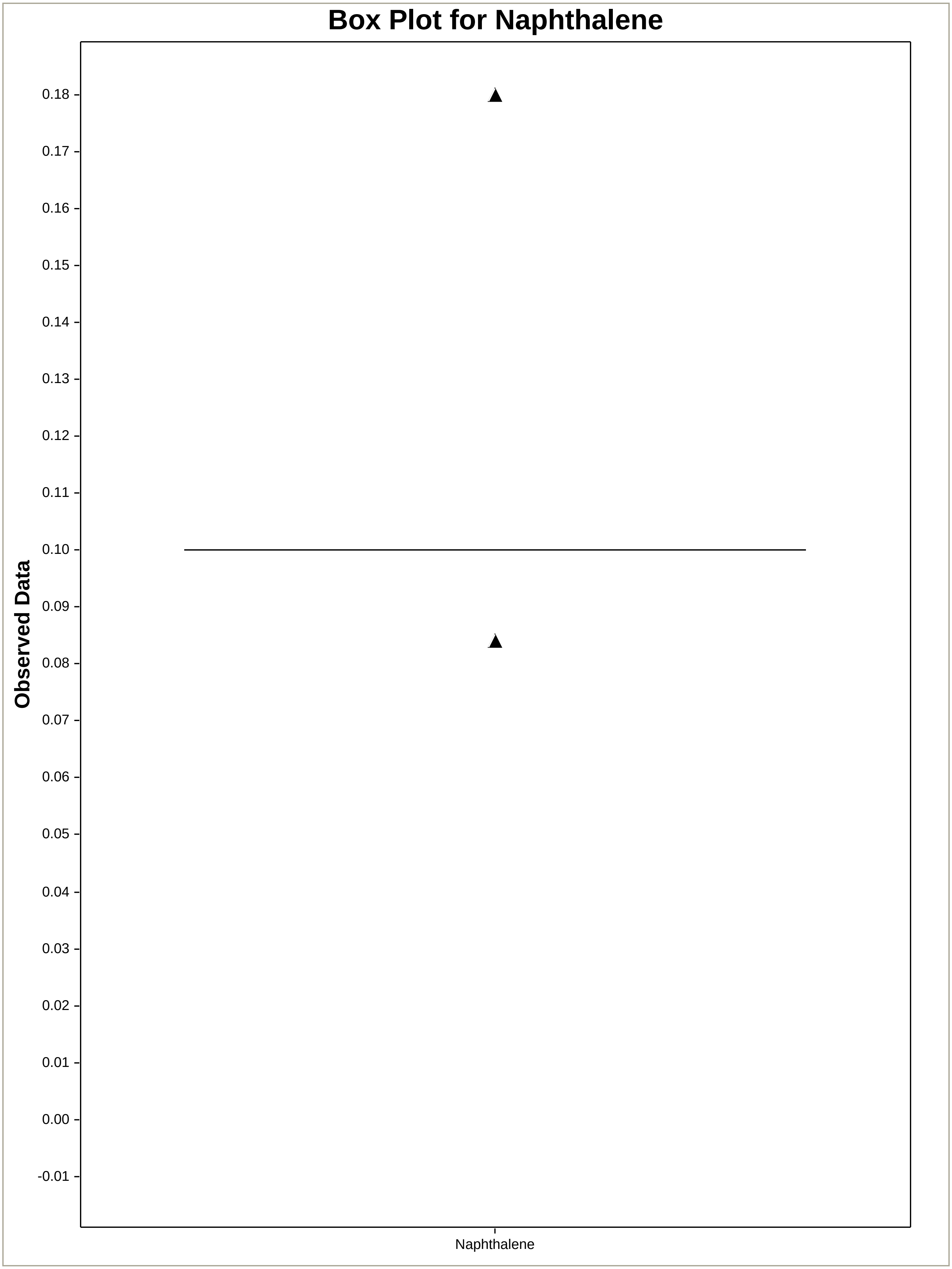


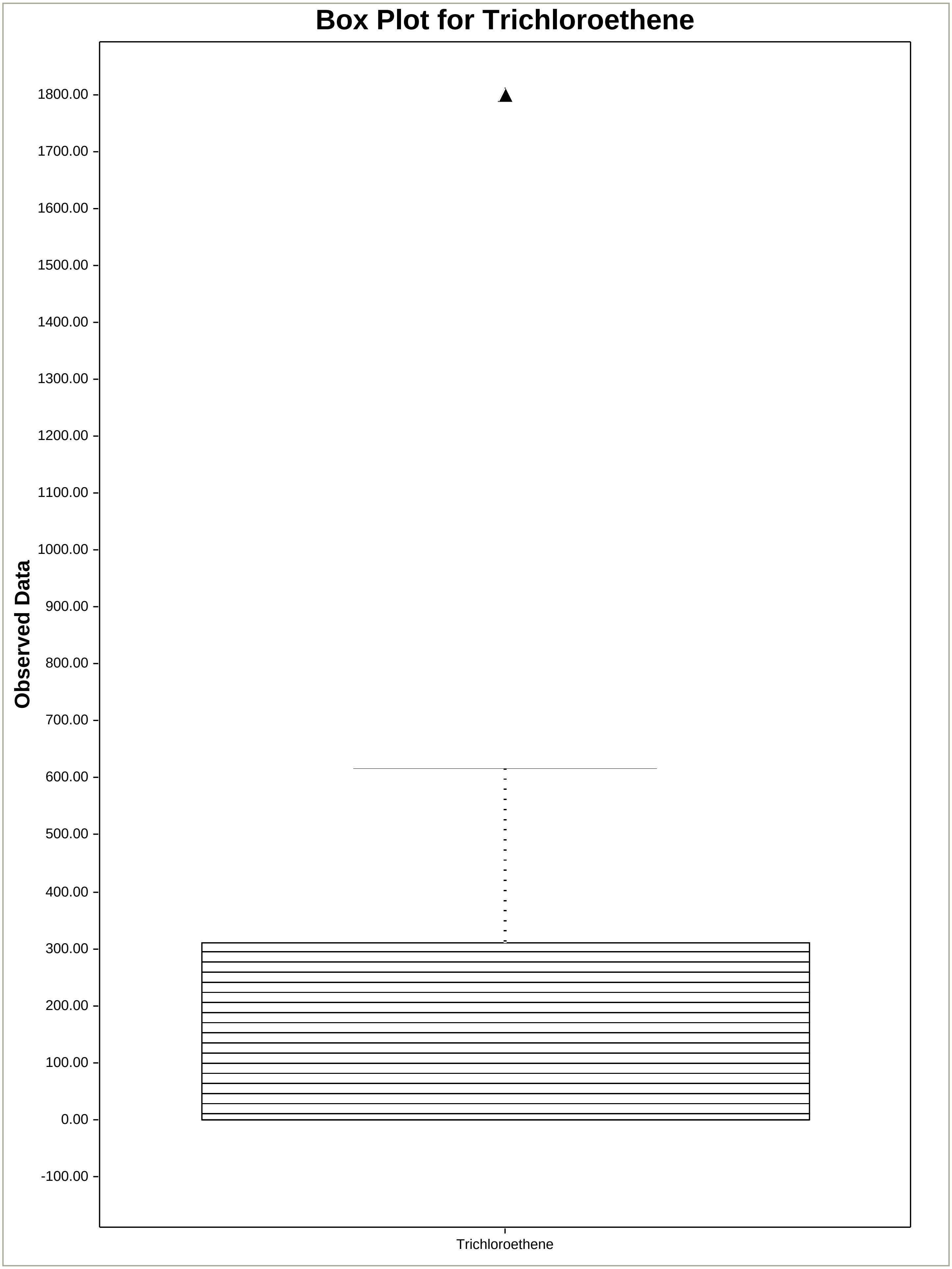
Box Plot for cis12DCE
Observed Data
32.00
31.00
30.00
29.00
28.00
27.00
26.00
25.00
24.00
23.00
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
cis12DCE



Box Plot for Mn
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Mn


Box Plot for MTBE
Observed Data
340.00
330.00
320.00
310.00
300.00
290.00
280.00
270.00
260.00
250.00
240.00
230.00
220.00
210.00
200.00
190.00
180.00
170.00
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
MTBE


Box Plot for Naphthalene
Observed Data
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
Naphthalene


Box Plot for Trichloroethene
Observed Data
1800.00
1700.00
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
Trichloroethene

Benzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	12
Number of Distinct Detected Data	10	Number of Non-Detect Data	22
		Percent Non-Detects	64.71%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.155	Minimum Detected	-1.864
Maximum Detected	24	Maximum Detected	3.178
Mean of Detected	2.708	Mean of Detected	-0.196
SD of Detected	6.733	SD of Detected	1.27
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.396	Shapiro Wilk Test Statistic	0.838
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	25.28	Mean	0.506
SD	64.28	SD	2.287
95% DL/2 (t) UCL	43.94	95% H-Stat (DL/2) UCL	126.4
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.984
		SD in Log Scale	1.097
		Mean in Original Scale	1.148
		SD in Original Scale	4.062
		95% t UCL	2.327
		95% Percentile Bootstrap UCL	2.494
		95% BCA Bootstrap UCL	3.299
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.452	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.995		
nu star	10.84		
A-D Test Statistic	1.916	Nonparametric Statistics	
5% A-D Critical Value	0.783	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.783	Mean	1.357
5% K-S Critical Value	0.258	SD	4.384
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.867
		95% KM (t) UCL	2.824
Assuming Gamma Distribution		95% KM (z) UCL	2.782
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.793
Minimum	1.00E-12	95% KM (bootstrap t) UCL	15.78
Maximum	24	95% KM (BCA) UCL	3.018
Mean	6.099	95% KM (Percentile Bootstrap) UCL	2.922
Median	2.988	95% KM (Chebyshev) UCL	5.135
SD	7.215	97.5% KM (Chebyshev) UCL	6.77
k star	0.221	99% KM (Chebyshev) UCL	9.982
Theta star	27.59		
Nu star	15.03	Potential UCLs to Use	
AppChi2	7.282	95% KM (BCA) UCL	3.018
95% Gamma Approximate UCL	12.59		
95% Adjusted Gamma UCL	13.07		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chlorobenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	16
Number of Distinct Detected Data	16	Number of Non-Detect Data	18
		Percent Non-Detects	52.94%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.21	Minimum Detected	-1.561
Maximum Detected	65	Maximum Detected	4.174
Mean of Detected	18.98	Mean of Detected	1.561
SD of Detected	22.74	SD of Detected	2.156
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.794	Shapiro Wilk Test Statistic	0.865
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	32.72	Mean	1.193
SD	63.84	SD	2.534
95% DL/2 (t) UCL	51.25	95% H-Stat (DL/2) UCL	654
Maximum Likelihood Estimate(MLE) Method N/A		Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.513
		SD in Log Scale	1.96
		Mean in Original Scale	9.53
		SD in Original Scale	17.82
		95% t UCL	14.7
		95% Percentile Bootstrap UCL	14.63
		95% BCA Bootstrap UCL	16.04
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.419	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	45.28		
nu star	13.41		
A-D Test Statistic	0.705	Nonparametric Statistics	
5% A-D Critical Value	0.804	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.804	Mean	10.66
5% K-S Critical Value	0.228	SD	18.58
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.538
		95% KM (t) UCL	16.65
Assuming Gamma Distribution		95% KM (z) UCL	16.48
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.58
Minimum	0.21	95% KM (bootstrap t) UCL	19.42
Maximum	72.25	95% KM (BCA) UCL	16.52
Mean	21.66	95% KM (Percentile Bootstrap) UCL	16.41
Median	15.06	95% KM (Chebyshev) UCL	26.09
SD	21.7	97.5% KM (Chebyshev) UCL	32.76
k star	0.639	99% KM (Chebyshev) UCL	45.86
Theta star	33.92		
Nu star	43.42	Potential UCLs to Use	
AppChi2	29.31	95% KM (t) UCL	16.65
95% Gamma Approximate UCL	32.09		
95% Adjusted Gamma UCL	32.73		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroform

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	10
Number of Distinct Detected Data	10	Number of Non-Detect Data	24
		Percent Non-Detects	70.59%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.37	Minimum Detected	-0.994
Maximum Detected	19	Maximum Detected	2.944
Mean of Detected	3.474	Mean of Detected	0.52
SD of Detected	5.637	SD of Detected	1.164
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.946
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	25.33	Mean	0.599
SD	64.21	SD	2.279
95% DL/2 (t) UCL	43.97	95% H-Stat (DL/2) UCL	135.1
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.536
		SD in Log Scale	1.126
		Mean in Original Scale	1.359
		SD in Original Scale	3.263
		95% t UCL	2.306
		95% Percentile Bootstrap UCL	2.422
		95% BCA Bootstrap UCL	3.278
		95% H-UCL	1.839
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.638	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5.445		
nu star	12.76		
A-D Test Statistic	0.707	Nonparametric Statistics	
5% A-D Critical Value	0.755	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.755	Mean	1.609
5% K-S Critical Value	0.275	SD	3.578
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.73
		95% KM (t) UCL	2.845
Assuming Gamma Distribution		95% KM (z) UCL	2.81
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.811
Minimum	1.00E-06	95% KM (bootstrap t) UCL	6.455
Maximum	19	95% KM (BCA) UCL	3.121
Mean	1.269	95% KM (Percentile Bootstrap) UCL	2.948
Median	1.00E-06	95% KM (Chebyshev) UCL	4.793
SD	3.332	97.5% KM (Chebyshev) UCL	6.17
k star	0.119	99% KM (Chebyshev) UCL	8.876
Theta star	10.67		
Nu star	8.085	Potential UCLs to Use	
AppChi2	2.784	95% KM (t) UCL	2.845
95% Gamma Approximate UCL	3.684		
95% Adjusted Gamma UCL	3.897		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dibromo-3-chloropropane

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	27
		Percent Non-Detects	79.41%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.039	Minimum Detected	-3.244
Maximum Detected	0.39	Maximum Detected	-0.942
Mean of Detected	0.129	Mean of Detected	-2.342
SD of Detected	0.124	SD of Detected	0.764
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.707	Shapiro Wilk Test Statistic	0.877
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0463	Mean	-3.412
SD	0.0677	SD	0.642
95% DL/2 (t) UCL	0.066	95% H-Stat (DL/2) UCL	0.051
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-3.413
		SD in Log Scale	0.871
		Mean in Original Scale	0.0504
		SD in Original Scale	0.0682
		95% t UCL	0.0702
		95% Percentile Bootstrap UCL	0.0711
		95% BCA Bootstrap UCL	0.0843
		95% H-UCL	0.0682
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.164	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.11		
nu star	16.29		
A-D Test Statistic	0.717	Nonparametric Statistics	
5% A-D Critical Value	0.717	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.717	Mean	0.0574
5% K-S Critical Value	0.316	SD	0.0633
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	0.0117
		95% KM (t) UCL	0.0773
Assuming Gamma Distribution		95% KM (z) UCL	0.0767
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.078
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.127
Maximum	0.39	95% KM (BCA) UCL	0.0994
Mean	0.0502	95% KM (Percentile Bootstrap) UCL	0.0949
Median	0.0305	95% KM (Chebyshev) UCL	0.109
SD	0.0752	97.5% KM (Chebyshev) UCL	0.131
k star	0.178	99% KM (Chebyshev) UCL	0.174
Theta star	0.282		
Nu star	12.1	Potential UCLs to Use	
AppChi2	5.295	95% KM (t) UCL	0.0773
95% Gamma Approximate UCL	0.115		
95% Adjusted Gamma UCL	0.12		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Dibromochloromethane

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.43	Minimum Detected	-0.844
Maximum Detected	1.2	Maximum Detected	0.182
Mean of Detected	0.815	Mean of Detected	-0.331
SD of Detected	0.544	SD of Detected	0.726
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	24.63	Mean	0.243
SD	64.41	SD	2.352
95% DL/2 (t) UCL	43.32	95% H-Stat (DL/2) UCL	124.1
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.465
5% K-S Critical Value	N/A	SD	0.16
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0484
		95% KM (t) UCL	0.547
Assuming Gamma Distribution		95% KM (z) UCL	0.545
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.962
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	1.2
Median	N/A	95% KM (Chebyshev) UCL	0.676
SD	N/A	97.5% KM (Chebyshev) UCL	0.767
k star	N/A	99% KM (Chebyshev) UCL	0.946
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.547
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	1.2
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichlorobenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	13
Number of Distinct Detected Data	12	Number of Non-Detect Data	21
		Percent Non-Detects	61.76%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.2	Minimum Detected	-1.609
Maximum Detected	56	Maximum Detected	4.025
Mean of Detected	7.864	Mean of Detected	0.893
SD of Detected	15.28	SD of Detected	1.55
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.541	Shapiro Wilk Test Statistic	0.982
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	27.14	Mean	0.861
SD	64.2	SD	2.293
95% DL/2 (t) UCL	45.77	95% H-Stat (DL/2) UCL	184.7
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.614
		SD in Log Scale	1.774
		Mean in Original Scale	3.224
		SD in Original Scale	9.934
		95% t UCL	6.107
		95% Percentile Bootstrap UCL	6.324
		95% BCA Bootstrap UCL	8.008
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.464	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	16.93		
nu star	12.08		
A-D Test Statistic	0.707	Nonparametric Statistics	
5% A-D Critical Value	0.787	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.787	Mean	3.791
5% K-S Critical Value	0.249	SD	10.4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.995
		95% KM (t) UCL	7.166
Assuming Gamma Distribution		95% KM (z) UCL	7.072
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	6.978
Minimum	1.00E-12	95% KM (bootstrap t) UCL	15.89
Maximum	60.6	95% KM (BCA) UCL	7.864
Mean	13.79	95% KM (Percentile Bootstrap) UCL	7.422
Median	7.5	95% KM (Chebyshev) UCL	12.49
SD	17.24	97.5% KM (Chebyshev) UCL	16.25
k star	0.179	99% KM (Chebyshev) UCL	23.64
Theta star	77.12		
Nu star	12.16	Potential UCLs to Use	
AppChi2	5.334	95% KM (t) UCL	7.166
95% Gamma Approximate UCL	31.45		
95% Adjusted Gamma UCL	32.82		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,3-Dichlorobenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	14
Number of Distinct Detected Data	13	Number of Non-Detect Data	20
		Percent Non-Detects	58.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.24	Minimum Detected	-1.427
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	13.65	Mean of Detected	1.241
SD of Detected	31.16	SD of Detected	1.687
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	29.42	Mean	0.888
SD	65.87	SD	2.381
95% DL/2 (t) UCL	48.54	95% H-Stat (DL/2) UCL	264.3
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.157
		SD in Log Scale	1.833
		Mean in Original Scale	5.947
		SD in Original Scale	20.63
		95% t UCL	11.93
		95% Percentile Bootstrap UCL	12.64
		95% BCA Bootstrap UCL	16.51
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.415	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	32.89		
nu star	11.62		
A-D Test Statistic	0.798	Nonparametric Statistics	
5% A-D Critical Value	0.8	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.8	Mean	6.81
5% K-S Critical Value	0.243	SD	21.56
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	4.096
		95% KM (t) UCL	13.74
Assuming Gamma Distribution		95% KM (z) UCL	13.55
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.62
Minimum	1.00E-12	95% KM (bootstrap t) UCL	35.01
Maximum	128	95% KM (BCA) UCL	14.13
Mean	25.4	95% KM (Percentile Bootstrap) UCL	14.37
Median	12.4	95% KM (Chebyshev) UCL	24.66
SD	36.58	97.5% KM (Chebyshev) UCL	32.39
k star	0.153	99% KM (Chebyshev) UCL	47.56
Theta star	166		
Nu star	10.41	Potential UCLs to Use	
AppChi2	4.197	95% KM (t) UCL	13.74
95% Gamma Approximate UCL	62.99		
95% Adjusted Gamma UCL	66.04		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,4-Dichlorobenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	14
Number of Distinct Detected Data	14	Number of Non-Detect Data	20
		Percent Non-Detects	58.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.43	Minimum Detected	-0.844
Maximum Detected	110	Maximum Detected	4.7
Mean of Detected	23.22	Mean of Detected	1.996
SD of Detected	29.86	SD of Detected	1.893
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.754	Shapiro Wilk Test Statistic	0.9
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	33.36	Mean	1.199
SD	64.82	SD	2.516
95% DL/2 (t) UCL	52.18	95% H-Stat (DL/2) UCL	612.2
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.196
		SD in Log Scale	2.202
		Mean in Original Scale	9.985
		SD in Original Scale	21.87
		95% t UCL	16.33
		95% Percentile Bootstrap UCL	16.89
		95% BCA Bootstrap UCL	18.84
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.476	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	48.75		
nu star	13.34		
A-D Test Statistic	0.499	Nonparametric Statistics	
5% A-D Critical Value	0.789	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.789	Mean	11.55
5% K-S Critical Value	0.241	SD	22.77
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	4.361
		95% KM (t) UCL	18.93
Assuming Gamma Distribution		95% KM (z) UCL	18.72
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	18.74
Minimum	1.00E-12	95% KM (bootstrap t) UCL	24.15
Maximum	132.8	95% KM (BCA) UCL	18.82
Mean	31.41	95% KM (Percentile Bootstrap) UCL	19.27
Median	26.02	95% KM (Chebyshev) UCL	30.56
SD	35.55	97.5% KM (Chebyshev) UCL	38.78
k star	0.213	99% KM (Chebyshev) UCL	54.94
Theta star	147.2		
Nu star	14.51	Potential UCLs to Use	
AppChi2	6.922	95% KM (t) UCL	18.93
95% Gamma Approximate UCL	65.84		
95% Adjusted Gamma UCL	68.4		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	29
		Percent Non-Detects	85.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.55	Minimum Detected	-0.598
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	3.13	Mean of Detected	0.545
SD of Detected	4.415	SD of Detected	1.111
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.632	Shapiro Wilk Test Statistic	0.847
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	25.02	Mean	0.465
SD	64.28	SD	2.317
95% DL/2 (t) UCL	43.68	95% H-Stat (DL/2) UCL	135.7
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.582
		SD in Log Scale	1.894
		Mean in Original Scale	0.537
		SD in Original Scale	1.888
		95% t UCL	1.085
		95% Percentile Bootstrap UCL	1.148
		95% BCA Bootstrap UCL	1.517
		95% H-UCL	1.544
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.522	Data appear Lognormal at 5% Significance Level	
Theta Star	5.997		
nu star	5.219		
A-D Test Statistic	0.748	Nonparametric Statistics	
5% A-D Critical Value	0.692	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.692	Mean	1.097
5% K-S Critical Value	0.365	SD	2.084
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.476
		95% KM (t) UCL	1.903
Assuming Gamma Distribution		95% KM (z) UCL	1.88
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.756
Minimum	1.00E-06	95% KM (bootstrap t) UCL	4.541
Maximum	11	95% KM (BCA) UCL	2.918
Mean	0.46	95% KM (Percentile Bootstrap) UCL	2.364
Median	1.00E-06	95% KM (Chebyshev) UCL	3.172
SD	1.905	97.5% KM (Chebyshev) UCL	4.07
k star	0.0895	99% KM (Chebyshev) UCL	5.834
Theta star	5.141		
Nu star	6.089	Potential UCLs to Use	
AppChi2	1.685	95% KM (BCA) UCL	2.918
95% Gamma Approximate UCL	1.663		
95% Adjusted Gamma UCL	1.781		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	29
		Percent Non-Detects	85.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.22	Minimum Detected	-1.514
Maximum Detected	15	Maximum Detected	2.708
Mean of Detected	3.282	Mean of Detected	-0.367
SD of Detected	6.553	SD of Detected	1.768
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.739
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	24.86	Mean	0.235
SD	64.36	SD	2.385
95% DL/2 (t) UCL	43.54	95% H-Stat (DL/2) UCL	139.8
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.181
		SD in Log Scale	1.029
		Mean in Original Scale	0.786
		SD in Original Scale	2.525
		95% t UCL	1.519
		95% Percentile Bootstrap UCL	1.637
		95% BCA Bootstrap UCL	2.127
		95% H-UCL	0.814
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.301	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.89		
nu star	3.013		
A-D Test Statistic	0.957	Nonparametric Statistics	
5% A-D Critical Value	0.722	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.722	Mean	0.822
5% K-S Critical Value	0.375	SD	2.782
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.599
		95% KM (t) UCL	1.836
Assuming Gamma Distribution		95% KM (z) UCL	1.808
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.751
Minimum	1.00E-06	95% KM (bootstrap t) UCL	17.53
Maximum	15	95% KM (BCA) UCL	2.226
Mean	1.161	95% KM (Percentile Bootstrap) UCL	1.924
Median	1.00E-06	95% KM (Chebyshev) UCL	3.433
SD	2.78	97.5% KM (Chebyshev) UCL	4.563
k star	0.119	99% KM (Chebyshev) UCL	6.783
Theta star	9.797		
Nu star	8.06	Potential UCLs to Use	
AppChi2	2.77	97.5% KM (Chebyshev) UCL	4.563
95% Gamma Approximate UCL	3.379		
95% Adjusted Gamma UCL	3.575		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	13
Number of Distinct Detected Data	12	Number of Non-Detect Data	21
		Percent Non-Detects	61.76%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.725	Minimum Detected	-0.322
Maximum Detected	280	Maximum Detected	5.635
Mean of Detected	28.27	Mean of Detected	1.726
SD of Detected	75.98	SD of Detected	1.657
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.39	Shapiro Wilk Test Statistic	0.927
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	35.12	Mean	1.275
SD	76.91	SD	2.319
95% DL/2 (t) UCL	57.45	95% H-Stat (DL/2) UCL	307.8
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.223
		SD in Log Scale	2.135
		Mean in Original Scale	11.11
		SD in Original Scale	47.83
		95% t UCL	24.99
		95% Percentile Bootstrap UCL	27.1
		95% BCA Bootstrap UCL	42.58
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.364	Data appear Lognormal at 5% Significance Level	
Theta Star	77.7		
nu star	9.458		
A-D Test Statistic	1.323	Nonparametric Statistics	
5% A-D Critical Value	0.809	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.809	Mean	12.49
5% K-S Critical Value	0.253	SD	48.39
Data not Gamma Distributed at 5% Significance Level		SE of Mean	8.916
		95% KM (t) UCL	27.57
Assuming Gamma Distribution		95% KM (z) UCL	27.15
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	27.21
Minimum	1.00E-12	95% KM (bootstrap t) UCL	121.5
Maximum	280	95% KM (BCA) UCL	30.54
Mean	39.76	95% KM (Percentile Bootstrap) UCL	29.65
Median	9.376	95% KM (Chebyshev) UCL	51.35
SD	68.94	97.5% KM (Chebyshev) UCL	68.16
k star	0.134	99% KM (Chebyshev) UCL	101.2
Theta star	297.7		
Nu star	9.083	Potential UCLs to Use	
AppChi2	3.377	97.5% KM (Chebyshev) UCL	68.16
95% Gamma Approximate UCL	106.9		
95% Adjusted Gamma UCL	112.6		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

cis-1,2-Dichloroethene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	32
Number of Distinct Detected Data	28	Number of Non-Detect Data	2
		Percent Non-Detects	5.88%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.96	Minimum Detected	-0.0408
Maximum Detected	390000	Maximum Detected	12.87
Mean of Detected	21780	Mean of Detected	6.548
SD of Detected	71726	SD of Detected	3.386
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.342	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	20499	Mean	6.081
SD	69713	SD	3.79
95% DL/2 (t) UCL	40732	95% H-Stat (DL/2) UCL	50855438
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	17502	Mean in Log Scale	6.079
SD	71253	SD in Log Scale	3.797
95% MLE (t) UCL	38182	Mean in Original Scale	20499
95% MLE (Tiku) UCL	36122	SD in Original Scale	69713
		95% t UCL	40732
		95% Percentile Bootstrap UCL	44072
		95% BCA Bootstrap UCL	59613
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.213	Data appear Lognormal at 5% Significance Level	
Theta Star	102300		
nu star	13.63		
A-D Test Statistic	1.394	Nonparametric Statistics	
5% A-D Critical Value	0.893	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.893	Mean	20499
5% K-S Critical Value	0.172	SD	68680
Data not Gamma Distributed at 5% Significance Level		SE of Mean	11967
		95% KM (t) UCL	40751
Assuming Gamma Distribution		95% KM (z) UCL	40183
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	40732
Minimum	1.00E-12	95% KM (bootstrap t) UCL	113532
Maximum	390000	95% KM (BCA) UCL	42416
Mean	20499	95% KM (Percentile Bootstrap) UCL	41743
Median	1050	95% KM (Chebyshev) UCL	72662
SD	69713	97.5% KM (Chebyshev) UCL	95233
k star	0.15	99% KM (Chebyshev) UCL	139569
Theta star	136262		
Nu star	10.23	Potential UCLs to Use	
AppChi2	4.086	99% KM (Chebyshev) UCL	139569
95% Gamma Approximate UCL	51323		
95% Adjusted Gamma UCL	53839		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

trans-1,2-Dichloroethene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	23
Number of Distinct Detected Data	22	Number of Non-Detect Data	11
		Percent Non-Detects	32.35%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	1300	Maximum Detected	7.17
Mean of Detected	137.4	Mean of Detected	2.684
SD of Detected	338.3	SD of Detected	2.269
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	250	Maximum Non-Detect	5.521
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	31
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	91.18%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.45	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	100.8	Mean	1.929
SD	282.8	SD	2.584
95% DL/2 (t) UCL	182.9	95% H-Stat (DL/2) UCL	1679
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.593
		SD in Log Scale	2.589
		Mean in Original Scale	93.44
		SD in Original Scale	283.7
		95% t UCL	175.8
		95% Percentile Bootstrap UCL	178.1
		95% BCA Bootstrap UCL	225
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.296	Data appear Lognormal at 5% Significance Level	
Theta Star	464.7		
nu star	13.6		
A-D Test Statistic	1.871	Nonparametric Statistics	
5% A-D Critical Value	0.847	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.847	Mean	93.95
5% K-S Critical Value	0.197	SD	279.4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	48.99
		95% KM (t) UCL	176.9
Assuming Gamma Distribution		95% KM (z) UCL	174.5
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	176.3
Minimum	1.00E-12	95% KM (bootstrap t) UCL	329.6
Maximum	1300	95% KM (BCA) UCL	176.1
Mean	105.7	95% KM (Percentile Bootstrap) UCL	181.8
Median	7.3	95% KM (Chebyshev) UCL	307.5
SD	288.8	97.5% KM (Chebyshev) UCL	399.9
k star	0.0959	99% KM (Chebyshev) UCL	581.4
Theta star	1102		
Nu star	6.521	Potential UCLs to Use	
AppChi2	1.912	99% KM (Chebyshev) UCL	581.4
95% Gamma Approximate UCL	360.4		
95% Adjusted Gamma UCL	384.7		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Ethylbenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.62	Minimum Detected	-0.478
Maximum Detected	20	Maximum Detected	2.996
Mean of Detected	10.31	Mean of Detected	1.259
SD of Detected	13.7	SD of Detected	2.456
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	25	Mean	0.241
SD	64.35	SD	2.396
95% DL/2 (t) UCL	43.68	95% H-Stat (DL/2) UCL	146.5
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.312
5% K-S Critical Value	N/A	SD	3.596
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.961
		95% KM (t) UCL	2.939
Assuming Gamma Distribution		95% KM (z) UCL	2.893
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.92
Minimum	N/A	95% KM (bootstrap t) UCL	1.463
Maximum	N/A	95% KM (BCA) UCL	20
Mean	N/A	95% KM (Percentile Bootstrap) UCL	20
Median	N/A	95% KM (Chebyshev) UCL	5.502
SD	N/A	97.5% KM (Chebyshev) UCL	7.315
k star	N/A	99% KM (Chebyshev) UCL	10.88
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	99% KM (Chebyshev) UCL	10.88
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Methylcyclohexane

General Statistics (µg/L)			
Number of Valid Data	33	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	27
		Percent Non-Detects	81.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.89	Minimum Detected	-0.117
Maximum Detected	42	Maximum Detected	3.738
Mean of Detected	11.02	Mean of Detected	1.583
SD of Detected	15.66	SD of Detected	1.442
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	33
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.71	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	26.72	Mean	0.473
SD	65.14	SD	2.421
95% DL/2 (t) UCL	45.93	95% H-Stat (DL/2) UCL	207.1
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.183
		SD in Log Scale	2.449
		Mean in Original Scale	2.107
		SD in Original Scale	7.518
		95% t UCL	4.323
		95% Percentile Bootstrap UCL	4.626
		95% BCA Bootstrap UCL	6.338
		95% H-UCL	16.23
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.479	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	23.01		
nu star	5.745		
A-D Test Statistic	0.31	Nonparametric Statistics	
5% A-D Critical Value	0.722	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.722	Mean	3.132
5% K-S Critical Value	0.344	SD	7.826
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.627
		95% KM (t) UCL	5.888
Assuming Gamma Distribution		95% KM (z) UCL	5.808
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.518
Minimum	1.00E-06	95% KM (bootstrap t) UCL	11.3
Maximum	42	95% KM (BCA) UCL	11
Mean	2.003	95% KM (Percentile Bootstrap) UCL	7.8
Median	1.00E-06	95% KM (Chebyshev) UCL	10.22
SD	7.545	97.5% KM (Chebyshev) UCL	13.29
k star	0.0857	99% KM (Chebyshev) UCL	19.32
Theta star	23.36		
Nu star	5.657	Potential UCLs to Use	
AppChi2	1.467	95% KM (t) UCL	5.888
95% Gamma Approximate UCL	7.722		
95% Adjusted Gamma UCL	8.323		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Methylene chloride

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	30
		Percent Non-Detects	88.24%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.36	Minimum Detected	-1.022
Maximum Detected	7	Maximum Detected	1.946
Mean of Detected	2.125	Mean of Detected	-0.0595
SD of Detected	3.253	SD of Detected	1.362
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.667	Shapiro Wilk Test Statistic	0.796
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	24.63	Mean	0.242
SD	64.41	SD	2.348
95% DL/2 (t) UCL	43.33	95% H-Stat (DL/2) UCL	122.2
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.847
		SD in Log Scale	0.773
		Mean in Original Scale	0.655
		SD in Original Scale	1.15
		95% t UCL	0.989
		95% Percentile Bootstrap UCL	1.027
		95% BCA Bootstrap UCL	1.252
		95% H-UCL	0.776
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.351	Data appear Lognormal at 5% Significance Level	
Theta Star	6.052		
nu star	2.809		
A-D Test Statistic	0.69	Nonparametric Statistics	
5% A-D Critical Value	0.671	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.671	Mean	0.696
5% K-S Critical Value	0.405	SD	1.316
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.312
		95% KM (t) UCL	1.225
Assuming Gamma Distribution		95% KM (z) UCL	1.21
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.176
Minimum	1.00E-06	95% KM (bootstrap t) UCL	4.831
Maximum	7	95% KM (BCA) UCL	N/A
Mean	0.762	95% KM (Percentile Bootstrap) UCL	1.957
Median	0.259	95% KM (Chebyshev) UCL	2.058
SD	1.334	97.5% KM (Chebyshev) UCL	2.647
k star	0.163	99% KM (Chebyshev) UCL	3.804
Theta star	4.668		
Nu star	11.09	Potential UCLs to Use	
AppChi2	4.636	95% KM (BCA) UCL	N/A
95% Gamma Approximate UCL	1.822		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Tetrachloroethene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	21
Number of Distinct Detected Data	18	Number of Non-Detect Data	13
		Percent Non-Detects	38.24%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	1600	Maximum Detected	7.378
Mean of Detected	98	Mean of Detected	1.758
SD of Detected	346.2	SD of Detected	2.314
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	33
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.06%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.297	Shapiro Wilk Test Statistic	0.932
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	83.84	Mean	1.707
SD	276.2	SD	2.513
95% DL/2 (t) UCL	164	95% H-Stat (DL/2) UCL	1007
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.821
		SD in Log Scale	2.37
		Mean in Original Scale	61.04
		SD in Original Scale	273.7
		95% t UCL	140.5
		95% Percentile Bootstrap UCL	152.6
		95% BCA Bootstrap UCL	205
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.247	Data appear Lognormal at 5% Significance Level	
Theta Star	396.8		
nu star	10.37		
A-D Test Statistic	2.15	Nonparametric Statistics	
5% A-D Critical Value	0.868	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.868	Mean	62.72
5% K-S Critical Value	0.208	SD	269.6
Data not Gamma Distributed at 5% Significance Level		SE of Mean	47.42
		95% KM (t) UCL	143
Assuming Gamma Distribution		95% KM (z) UCL	140.7
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	142.2
Minimum	0.25	95% KM (bootstrap t) UCL	647.4
Maximum	1600	95% KM (BCA) UCL	162.7
Mean	98.47	95% KM (Percentile Bootstrap) UCL	154.6
Median	71.59	95% KM (Chebyshev) UCL	269.4
SD	269.5	97.5% KM (Chebyshev) UCL	358.8
k star	0.366	99% KM (Chebyshev) UCL	534.5
Theta star	269		
Nu star	24.89	Potential UCLs to Use	
AppChi2	14.53	99% KM (Chebyshev) UCL	534.5
95% Gamma Approximate UCL	168.7		
95% Adjusted Gamma UCL	173.4		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2,3-Trichlorobenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	16
Number of Distinct Detected Data	15	Number of Non-Detect Data	18
		Percent Non-Detects	52.94%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.58	Minimum Detected	-0.545
Maximum Detected	280	Maximum Detected	5.635
Mean of Detected	29.91	Mean of Detected	1.654
SD of Detected	70.46	SD of Detected	1.881
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.471	Shapiro Wilk Test Statistic	0.925
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	37.86	Mean	1.236
SD	77.35	SD	2.439
95% DL/2 (t) UCL	60.31	95% H-Stat (DL/2) UCL	468.9
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.184
		SD in Log Scale	2.468
		Mean in Original Scale	14.32
		SD in Original Scale	49.8
		95% t UCL	28.77
		95% Percentile Bootstrap UCL	30.31
		95% BCA Bootstrap UCL	41.31
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.351	Data appear Lognormal at 5% Significance Level	
Theta Star	85.28		
nu star	11.22		
A-D Test Statistic	1.16	Nonparametric Statistics	
5% A-D Critical Value	0.821	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.821	Mean	15.99
5% K-S Critical Value	0.231	SD	50.49
Data not Gamma Distributed at 5% Significance Level		SE of Mean	9.266
		95% KM (t) UCL	31.67
Assuming Gamma Distribution		95% KM (z) UCL	31.23
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	31.41
Minimum	1.00E-12	95% KM (bootstrap t) UCL	94.56
Maximum	280	95% KM (BCA) UCL	32.79
Mean	31.75	95% KM (Percentile Bootstrap) UCL	32.39
Median	5.55	95% KM (Chebyshev) UCL	56.38
SD	63.82	97.5% KM (Chebyshev) UCL	73.86
k star	0.119	99% KM (Chebyshev) UCL	108.2
Theta star	265.8		
Nu star	8.124	Potential UCLs to Use	
AppChi2	2.807	97.5% KM (Chebyshev) UCL	73.86
95% Gamma Approximate UCL	91.89		
95% Adjusted Gamma UCL	97.18		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2,4-Trichlorobenzene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	21
Number of Distinct Detected Data	19	Number of Non-Detect Data	13
		Percent Non-Detects	38.24%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.4	Minimum Detected	-0.916
Maximum Detected	1600	Maximum Detected	7.378
Mean of Detected	143.5	Mean of Detected	3.043
SD of Detected	349	SD of Detected	2.242
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	33
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.06%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.435	Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	100.4	Mean	1.911
SD	281	SD	2.757
95% DL/2 (t) UCL	181.9	95% H-Stat (DL/2) UCL	3463
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	1.547
		SD in Log Scale	2.764
		Mean in Original Scale	89.02
		SD in Original Scale	280.7
		95% t UCL	170.5
		95% Percentile Bootstrap UCL	179.6
		95% BCA Bootstrap UCL	235.4
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.331	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	433		
nu star	13.92		
A-D Test Statistic	0.676	Nonparametric Statistics	
5% A-D Critical Value	0.836	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.836	Mean	91.01
5% K-S Critical Value	0.204	SD	276.5
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	48.69
		95% KM (t) UCL	173.4
Assuming Gamma Distribution		95% KM (z) UCL	171.1
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	172.5
Minimum	1.00E-12	95% KM (bootstrap t) UCL	372.3
Maximum	1600	95% KM (BCA) UCL	178.7
Mean	102.8	95% KM (Percentile Bootstrap) UCL	177.5
Median	9.75	95% KM (Chebyshev) UCL	303.3
SD	280.7	97.5% KM (Chebyshev) UCL	395.1
k star	0.0984	99% KM (Chebyshev) UCL	575.5
Theta star	1044		
Nu star	6.693	Potential UCLs to Use	
AppChi2	2.003	95% KM (BCA) UCL	178.7
95% Gamma Approximate UCL	343.3		
95% Adjusted Gamma UCL	365.9		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1,2-Trichloroethane

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	10
Number of Distinct Detected Data	10	Number of Non-Detect Data	24
		Percent Non-Detects	70.59%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.49	Minimum Detected	-0.713
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	18.34	Mean of Detected	1.64
SD of Detected	36.46	SD of Detected	1.651
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.532	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	29.55	Mean	0.88
SD	65.85	SD	2.402
95% DL/2 (t) UCL	48.66	95% H-Stat (DL/2) UCL	283.8
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.387
		SD in Log Scale	1.877
		Mean in Original Scale	5.738
		SD in Original Scale	20.76
		95% t UCL	11.76
		95% Percentile Bootstrap UCL	12.56
		95% BCA Bootstrap UCL	16.88
		95% H-UCL	13.13
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.417	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	43.99		
nu star	8.338		
A-D Test Statistic	0.641	Nonparametric Statistics	
5% A-D Critical Value	0.777	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.777	Mean	6.683
5% K-S Critical Value	0.281	SD	21.67
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	4.181
		95% KM (t) UCL	13.76
Assuming Gamma Distribution		95% KM (z) UCL	13.56
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.17
Minimum	1.00E-06	95% KM (bootstrap t) UCL	35.27
Maximum	120	95% KM (BCA) UCL	17.03
Mean	5.394	95% KM (Percentile Bootstrap) UCL	14.45
Median	1.00E-06	95% KM (Chebyshev) UCL	24.91
SD	20.84	97.5% KM (Chebyshev) UCL	32.8
k star	0.0894	99% KM (Chebyshev) UCL	48.29
Theta star	60.35		
Nu star	6.078	Potential UCLs to Use	
AppChi2	1.68	95% KM (t) UCL	13.76
95% Gamma Approximate UCL	19.52		
95% Adjusted Gamma UCL	20.9		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics (µg/L)			
Number of Valid Observations	34	Number of Distinct Observations	30
Raw Statistics		Log-transformed Statistics	
Minimum	0.53	Minimum of Log Data	-0.635
Maximum	170000	Maximum of Log Data	12.04
Mean	11107	Mean of log Data	6.298
Median	1400	SD of log Data	3.417
SD	31037		
Coefficient of Variation	2.794		
Skewness	4.538		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.395	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.933	Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20115	95% H-UCL	7341386
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	364272
95% Adjusted-CLT UCL (Chen-1995)	24288	97.5% Chebyshev (MVUE) UCL	487105
95% Modified-t UCL (Johnson-1978)	20806	99% Chebyshev (MVUE) UCL	728386
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.236	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	47057		
MLE of Mean	11107		
MLE of Standard Deviation	22862		
nu star	16.05		
Approximate Chi Square Value (.05)	7.998	Nonparametric Statistics	
Adjusted Level of Significance	0.0422	95% CLT UCL	19862
Adjusted Chi Square Value	7.717	95% Jackknife UCL	20115
		95% Standard Bootstrap UCL	19756
Anderson-Darling Test Statistic	0.567	95% Bootstrap-t UCL	48714
Anderson-Darling 5% Critical Value	0.883	95% Hall's Bootstrap UCL	55332
Kolmogorov-Smirnov Test Statistic	0.119	95% Percentile Bootstrap UCL	20775
Kolmogorov-Smirnov 5% Critical Value	0.166	95% BCA Bootstrap UCL	27922
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34309
		97.5% Chebyshev(Mean, Sd) UCL	44348
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	64068
95% Approximate Gamma UCL	22291		
95% Adjusted Gamma UCL	23103		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	23103

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

o-Xylene

General Statistics - Data are in µg/L.			
Number of Valid Data	34	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	31
		Percent Non-Detects	91.18%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.4	Minimum Detected	0.336
Maximum Detected	85	Maximum Detected	4.443
Mean of Detected	29.47	Mean of Detected	1.824
SD of Detected	48.09	SD of Detected	2.275
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	500	Maximum Non-Detect	6.215

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.755	Shapiro Wilk Test Statistic	0.815
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	26.99	Mean	0.369
SD	65.12	SD	2.437
95% DL/2 (t) UCL	45.89	95% H-Stat (DL/2) UCL	195.2
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-7.073
		SD in Log Scale	4.35
		Mean in Original Scale	2.609
		SD in Original Scale	14.56
		95% t UCL	6.836
		95% Percentile Bootstrap UCL	7.603
		95% BCA Bootstrap UCL	12.63
		95% H-UCL	3827
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Lognormal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	4.213
5% K-S Critical Value	N/A	SD	15
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.355
		95% KM (t) UCL	9.89
Assuming Gamma Distribution		95% KM (z) UCL	9.731
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.519
Minimum	N/A	95% KM (bootstrap t) UCL	279.8
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	85
Median	N/A	95% KM (Chebyshev) UCL	18.84
SD	N/A	97.5% KM (Chebyshev) UCL	25.16
k star	N/A	99% KM (Chebyshev) UCL	37.59
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	99% KM (Chebyshev) UCL	37.59
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Vinyl chloride

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	22
Number of Distinct Detected Data	22	Number of Non-Detect Data	12
		Percent Non-Detects	35.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.5	Minimum Detected	-0.693
Maximum Detected	860	Maximum Detected	6.757
Mean of Detected	138.9	Mean of Detected	3.483
SD of Detected	241.4	SD of Detected	2.112
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	250	Maximum Non-Detect	5.521
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	31
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	91.18%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.586	Shapiro Wilk Test Statistic	0.916
5% Shapiro Wilk Critical Value	0.911	5% Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	97.73	Mean	2.327
SD	202.7	SD	2.733
95% DL/2 (t) UCL	156.5	95% H-Stat (DL/2) UCL	4710
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.076
		SD in Log Scale	2.715
		Mean in Original Scale	90.6
		SD in Original Scale	203.7
		95% t UCL	149.7
		95% Percentile Bootstrap UCL	148.7
		95% BCA Bootstrap UCL	175.5
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.415	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	334.4		
nu star	18.27		
A-D Test Statistic	0.745	Nonparametric Statistics	
5% A-D Critical Value	0.816	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.816	Mean	92.01
5% K-S Critical Value	0.197	SD	200.5
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	35.26
		95% KM (t) UCL	151.7
Assuming Gamma Distribution		95% KM (z) UCL	150
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	151.2
Minimum	1.00E-12	95% KM (bootstrap t) UCL	211.9
Maximum	860	95% KM (BCA) UCL	158
Mean	104.1	95% KM (Percentile Bootstrap) UCL	155.6
Median	20	95% KM (Chebyshev) UCL	245.7
SD	211.1	97.5% KM (Chebyshev) UCL	312.2
k star	0.107	99% KM (Chebyshev) UCL	442.8
Theta star	971.5		
Nu star	7.285	Potential UCLs to Use	
AppChi2	2.328	95% KM (BCA) UCL	158
95% Gamma Approximate UCL	325.6		
95% Adjusted Gamma UCL	345.9		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(a)anthracene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.18	Minimum Detected	-1.715
Maximum Detected	1.7	Maximum Detected	0.531
Mean of Detected	0.94	Mean of Detected	-0.592
SD of Detected	1.075	SD of Detected	1.588
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.102	Mean	-2.854
SD	0.283	SD	0.637
95% DL/2 (t) UCL	0.185	95% H-Stat (DL/2) UCL	0.0886
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.225
5% K-S Critical Value	N/A	SD	0.257
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0623
		95% KM (t) UCL	0.33
Assuming Gamma Distribution		95% KM (z) UCL	0.327
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.496
SD	N/A	97.5% KM (Chebyshev) UCL	0.614
k star	N/A	99% KM (Chebyshev) UCL	0.844
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	0.614
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(a)pyrene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	31
		Percent Non-Detects	91.18%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	2.5	Maximum Detected	0.916
Mean of Detected	0.947	Mean of Detected	-0.886
SD of Detected	1.346	SD of Detected	1.571
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.769	Shapiro Wilk Test Statistic	0.841
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.129	Mean	-2.81
SD	0.42	SD	0.72
95% DL/2 (t) UCL	0.251	95% H-Stat (DL/2) UCL	0.102
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-11.09
		SD in Log Scale	5.553
		Mean in Original Scale	0.0845
		SD in Original Scale	0.429
		95% t UCL	0.209
		95% Percentile Bootstrap UCL	0.23
		95% BCA Bootstrap UCL	0.309
		95% H-UCL	970204
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.211
5% K-S Critical Value	N/A	SD	0.399
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0837
		95% KM (t) UCL	0.353
Assuming Gamma Distribution		95% KM (z) UCL	0.349
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.308
Minimum	N/A	95% KM (bootstrap t) UCL	2.303
Maximum	N/A	95% KM (BCA) UCL	2.5
Mean	N/A	95% KM (Percentile Bootstrap) UCL	2.5
Median	N/A	95% KM (Chebyshev) UCL	0.576
SD	N/A	97.5% KM (Chebyshev) UCL	0.734
k star	N/A	99% KM (Chebyshev) UCL	1.044
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.353
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	2.5
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(b)fluoranthene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	2.1	Maximum Detected	0.742
Mean of Detected	1.24	Mean of Detected	-0.113
SD of Detected	1.216	SD of Detected	1.209
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.12	Mean	-2.826
SD	0.354	SD	0.72
95% DL/2 (t) UCL	0.223	95% H-Stat (DL/2) UCL	0.1
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.431
5% K-S Critical Value	N/A	SD	0.291
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0705
		95% KM (t) UCL	0.55
Assuming Gamma Distribution		95% KM (z) UCL	0.547
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.738
SD	N/A	97.5% KM (Chebyshev) UCL	0.871
k star	N/A	99% KM (Chebyshev) UCL	1.132
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (BCA) UCL	N/A
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(g,h,i)perylene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	31
		Percent Non-Detects	91.18%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.17	Minimum Detected	-1.772
Maximum Detected	2.4	Maximum Detected	0.875
Mean of Detected	0.95	Mean of Detected	-0.723
SD of Detected	1.257	SD of Detected	1.407
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.885
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.129	Mean	-2.795
SD	0.404	SD	0.74
95% DL/2 (t) UCL	0.247	95% H-Stat (DL/2) UCL	0.106
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-10.02
		SD in Log Scale	5.055
		Mean in Original Scale	0.0854
		SD in Original Scale	0.413
		95% t UCL	0.205
		95% Percentile Bootstrap UCL	0.223
		95% BCA Bootstrap UCL	0.302
		95% H-UCL	41381
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.239
5% K-S Critical Value	N/A	SD	0.377
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0791
		95% KM (t) UCL	0.373
Assuming Gamma Distribution		95% KM (z) UCL	0.369
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.344
Minimum	N/A	95% KM (bootstrap t) UCL	1.233
Maximum	N/A	95% KM (BCA) UCL	2.4
Mean	N/A	95% KM (Percentile Bootstrap) UCL	2.4
Median	N/A	95% KM (Chebyshev) UCL	0.584
SD	N/A	97.5% KM (Chebyshev) UCL	0.733
k star	N/A	99% KM (Chebyshev) UCL	1.026
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	0.373
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	2.4
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(k)fluoranthene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.21	Minimum Detected	-1.561
Maximum Detected	2	Maximum Detected	0.693
Mean of Detected	1.105	Mean of Detected	-0.434
SD of Detected	1.266	SD of Detected	1.594
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.112	Mean	-2.845
SD	0.335	SD	0.672
95% DL/2 (t) UCL	0.209	95% H-Stat (DL/2) UCL	0.093
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.263
5% K-S Critical Value	N/A	SD	0.302
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0734
		95% KM (t) UCL	0.387
Assuming Gamma Distribution		95% KM (z) UCL	0.383
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.582
SD	N/A	97.5% KM (Chebyshev) UCL	0.721
k star	N/A	99% KM (Chebyshev) UCL	0.992
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	0.721
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Biphenyl

General Statistics - Data are in µg/L.

Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.1	Minimum Detected	0.0953
Maximum Detected	2.3	Maximum Detected	0.833
Mean of Detected	1.7	Mean of Detected	0.464
SD of Detected	0.849	SD of Detected	0.522
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.453	Mean	0.89
SD	0.242	SD	0.141
95% DL/2 (t) UCL	2.523	95% H-Stat (DL/2) UCL	2.565
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.7
5% K-S Critical Value	N/A	SD	0.6
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.6
		95% KM (t) UCL	2.715
Assuming Gamma Distribution		95% KM (z) UCL	2.687
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	4.315
SD	N/A	97.5% KM (Chebyshev) UCL	5.447
k star	N/A	99% KM (Chebyshev) UCL	7.67
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	95% KM (t) UCL	2.715
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Warning: Recommended UCL exceeds the maximum observation
Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Dibenzo(a,h)anthracene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	5
Number of Distinct Detected Data	4	Number of Non-Detect Data	29
		Percent Non-Detects	85.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.096	Minimum Detected	-2.343
Maximum Detected	5.5	Maximum Detected	1.705
Mean of Detected	1.195	Mean of Detected	-1.377
SD of Detected	2.407	SD of Detected	1.733
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.643
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.218	Mean	-2.758
SD	0.934	SD	0.838
95% DL/2 (t) UCL	0.489	95% H-Stat (DL/2) UCL	0.125
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.838
		SD in Log Scale	1.198
		Mean in Original Scale	0.231
		SD in Original Scale	0.932
		95% t UCL	0.501
		95% Percentile Bootstrap UCL	0.55
		95% BCA Bootstrap UCL	0.718
		95% H-UCL	0.211
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.301	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.968		
nu star	3.012		
A-D Test Statistic	1.152	Nonparametric Statistics	
5% A-D Critical Value	0.722	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.722	Mean	0.258
5% K-S Critical Value	0.375	SD	0.913
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.175
		95% KM (t) UCL	0.554
Assuming Gamma Distribution		95% KM (z) UCL	0.545
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.516
Minimum	1.00E-06	95% KM (bootstrap t) UCL	35.95
Maximum	5.5	95% KM (BCA) UCL	0.738
Mean	0.272	95% KM (Percentile Bootstrap) UCL	0.58
Median	1.00E-06	95% KM (Chebyshev) UCL	1.02
SD	0.953	97.5% KM (Chebyshev) UCL	1.35
k star	0.111	99% KM (Chebyshev) UCL	1.999
Theta star	2.448		
Nu star	7.568	Potential UCLs to Use	
AppChi2	2.487	97.5% KM (Chebyshev) UCL	1.35
95% Gamma Approximate UCL	0.829		
95% Adjusted Gamma UCL	0.879		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Indeno(1,2,3-cd)pyrene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	6
Number of Distinct Detected Data	4	Number of Non-Detect Data	28
		Percent Non-Detects	82.35%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	3.1	Maximum Detected	1.131
Mean of Detected	0.643	Mean of Detected	-1.427
SD of Detected	1.205	SD of Detected	1.292
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.532	Shapiro Wilk Test Statistic	0.683
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.155	Mean	-2.719
SD	0.522	SD	0.788
95% DL/2 (t) UCL	0.306	95% H-Stat (DL/2) UCL	0.122
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-6.196
		SD in Log Scale	3.198
		Mean in Original Scale	0.117
		SD in Original Scale	0.53
		95% t UCL	0.271
		95% Percentile Bootstrap UCL	0.298
		95% BCA Bootstrap UCL	0.394
		95% H-UCL	8.577
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.423	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.522		
nu star	5.072		
A-D Test Statistic	1.246	Nonparametric Statistics	
5% A-D Critical Value	0.729	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.729	Mean	0.204
5% K-S Critical Value	0.346	SD	0.505
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0948
		95% KM (t) UCL	0.365
Assuming Gamma Distribution		95% KM (z) UCL	0.36
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.353
Minimum	1.00E-06	95% KM (bootstrap t) UCL	5.808
Maximum	3.1	95% KM (BCA) UCL	0.379
Mean	0.114	95% KM (Percentile Bootstrap) UCL	0.384
Median	1.00E-06	95% KM (Chebyshev) UCL	0.617
SD	0.531	97.5% KM (Chebyshev) UCL	0.796
k star	0.0992	99% KM (Chebyshev) UCL	1.148
Theta star	1.144		
Nu star	6.748	Potential UCLs to Use	
AppChi2	2.034	95% KM (BCA) UCL	0.379
95% Gamma Approximate UCL	0.377		
95% Adjusted Gamma UCL	0.401		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	12
Number of Distinct Detected Data	9	Number of Non-Detect Data	22
		Percent Non-Detects	64.71%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.08	Minimum Detected	-2.526
Maximum Detected	6.5	Maximum Detected	1.872
Mean of Detected	1.285	Mean of Detected	-1.025
SD of Detected	2.093	SD of Detected	1.632
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.654	Shapiro Wilk Test Statistic	0.783
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.486	Mean	-2.3
SD	1.349	SD	1.342
95% DL/2 (t) UCL	0.877	95% H-Stat (DL/2) UCL	0.486
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.589
		SD in Log Scale	1.767
		Mean in Original Scale	0.488
		SD in Original Scale	1.349
		95% t UCL	0.879
		95% Percentile Bootstrap UCL	0.896
		95% BCA Bootstrap UCL	1.064
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.429	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.993		
nu star	10.3		
A-D Test Statistic	1.463	Nonparametric Statistics	
5% A-D Critical Value	0.785	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.785	Mean	0.51
5% K-S Critical Value	0.259	SD	1.321
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.237
		95% KM (t) UCL	0.911
Assuming Gamma Distribution		95% KM (z) UCL	0.9
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.9
Minimum	0.08	95% KM (bootstrap t) UCL	1.757
Maximum	6.5	95% KM (BCA) UCL	1.036
Mean	1.829	95% KM (Percentile Bootstrap) UCL	0.937
Median	1.455	95% KM (Chebyshev) UCL	1.542
SD	1.567	97.5% KM (Chebyshev) UCL	1.988
k star	0.952	99% KM (Chebyshev) UCL	2.865
Theta star	1.921		
Nu star	64.75	Potential UCLs to Use	
AppChi2	47.23	97.5% KM (Chebyshev) UCL	1.988
95% Gamma Approximate UCL	2.507		
95% Adjusted Gamma UCL	2.547		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Phenanthrene

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	32
		Percent Non-Detects	94.12%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.13	Minimum Detected	-2.04
Maximum Detected	1.5	Maximum Detected	0.405
Mean of Detected	0.815	Mean of Detected	-0.817
SD of Detected	0.969	SD of Detected	1.729
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.095	Mean	-2.868
SD	0.249	SD	0.601
95% DL/2 (t) UCL	0.167	95% H-Stat (DL/2) UCL	0.0842
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.17
5% K-S Critical Value	N/A	SD	0.231
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0561
		95% KM (t) UCL	0.265
Assuming Gamma Distribution		95% KM (z) UCL	0.263
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.415
SD	N/A	97.5% KM (Chebyshev) UCL	0.521
k star	N/A	99% KM (Chebyshev) UCL	0.729
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	0.521
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Total PCB Aroclors

General Statistics - Data are in µg/L.

Number of Valid Data	33	Number of Detected Data	21
Number of Distinct Detected Data	20	Number of Non-Detect Data	12
		Percent Non-Detects	36.36%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.045	Minimum Detected	-3.101
Maximum Detected	81	Maximum Detected	4.394
Mean of Detected	9.885	Mean of Detected	0.664
SD of Detected	18.96	SD of Detected	2.131
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.09	Maximum Non-Detect	-2.408
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	13
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	20
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	39.39%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.955
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.305	Mean	-0.776
SD	15.74	SD	2.571
95% DL/2 (t) UCL	10.95	95% H-Stat (DL/2) UCL	108.9
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.001
		SD in Log Scale	2.903
		Mean in Original Scale	6.304
		SD in Original Scale	15.74
		95% t UCL	10.95
		95% Percentile Bootstrap UCL	11.21
		95% BCA Bootstrap UCL	13.01
		95% H-UCL	374.8
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.378	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	26.16		
nu star	15.87		
A-D Test Statistic	0.589	Nonparametric Statistics	
5% A-D Critical Value	0.825	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.825	Mean	6.307
5% K-S Critical Value	0.203	SD	15.5
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.765
		95% KM (t) UCL	10.99
Assuming Gamma Distribution		95% KM (z) UCL	10.86
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	10.93
Minimum	1.00E-06	95% KM (bootstrap t) UCL	18.19
Maximum	81	95% KM (BCA) UCL	11.72
Mean	6.291	95% KM (Percentile Bootstrap) UCL	11.3
Median	0.328	95% KM (Chebyshev) UCL	18.36
SD	15.75	97.5% KM (Chebyshev) UCL	23.58
k star	0.132	99% KM (Chebyshev) UCL	33.82
Theta star	47.73		
Nu star	8.699	Potential UCLs to Use	
AppChi2	3.146	95% KM (BCA) UCL	11.72
95% Gamma Approximate UCL	17.39		
95% Adjusted Gamma UCL	18.39		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

alpha-BHC

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	9
Number of Distinct Detected Data	7	Number of Non-Detect Data	25
		Percent Non-Detects	73.53%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	2.7	Maximum Detected	0.993
Mean of Detected	0.753	Mean of Detected	-0.895
SD of Detected	0.901	SD of Detected	1.147
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.056	Maximum Non-Detect	-2.882
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	25
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	73.53%

Warning: There are only 9 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.745	Shapiro Wilk Test Statistic	0.848
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.218	Mean	-2.934
SD	0.551	SD	1.365
95% DL/2 (t) UCL	0.378	95% H-Stat (DL/2) UCL	0.271
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.125
		SD in Log Scale	2.432
		Mean in Original Scale	0.208
		SD in Original Scale	0.554
		95% t UCL	0.369
		95% Percentile Bootstrap UCL	0.372
		95% BCA Bootstrap UCL	0.44
		95% H-UCL	2.138
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.707	Data appear Lognormal at 5% Significance Level	
Theta Star	1.065		
nu star	12.73		
A-D Test Statistic	0.781	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.745	Mean	0.302
5% K-S Critical Value	0.287	SD	0.514
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0935
		95% KM (t) UCL	0.461
Assuming Gamma Distribution		95% KM (z) UCL	0.456
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.454
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.647
Maximum	2.7	95% KM (BCA) UCL	0.491
Mean	0.199	95% KM (Percentile Bootstrap) UCL	0.484
Median	1.00E-06	95% KM (Chebyshev) UCL	0.71
SD	0.557	97.5% KM (Chebyshev) UCL	0.886
k star	0.105	99% KM (Chebyshev) UCL	1.233
Theta star	1.906		
Nu star	7.116	Potential UCLs to Use	
AppChi2	2.234	95% KM (BCA) UCL	0.491
95% Gamma Approximate UCL	0.635		
95% Adjusted Gamma UCL	0.675		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

delta-BHC

General Statistics (µg/L)			
Number of Valid Data	31	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	29
		Percent Non-Detects	93.55%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.34	Minimum Detected	-1.079
Maximum Detected	3.6	Maximum Detected	1.281
Mean of Detected	1.97	Mean of Detected	0.101
SD of Detected	2.305	SD of Detected	1.669
Minimum Non-Detect	0.025	Minimum Non-Detect	-3.689
Maximum Non-Detect	0.056	Maximum Non-Detect	-2.882
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	29
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.55%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.151	Mean	-3.447
SD	0.643	SD	1.004
95% DL/2 (t) UCL	0.347	95% H-Stat (DL/2) UCL	0.0822
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.445
5% K-S Critical Value	N/A	SD	0.576
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.146
		95% KM (t) UCL	0.693
Assuming Gamma Distribution		95% KM (z) UCL	0.686
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.581
Minimum	N/A	95% KM (bootstrap t) UCL	0.445
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	1.083
SD	N/A	97.5% KM (Chebyshev) UCL	1.359
k star	N/A	99% KM (Chebyshev) UCL	1.901
Theta star	N/A		
Nu star	N/A	Potential UCLs to Use	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	1.359
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

gamma-BHC

General Statistics (µg/L)

Number of Valid Data	34	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	30
		Percent Non-Detects	88.24%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.065	Minimum Detected	-2.733
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.579	Mean of Detected	-1.011
SD of Detected	0.53	SD of Detected	1.273
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.056	Maximum Non-Detect	-2.882

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	4
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	88.24%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.949	Shapiro Wilk Test Statistic	0.957
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0906	Mean	-3.355
SD	0.241	SD	0.95
95% DL/2 (t) UCL	0.161	95% H-Stat (DL/2) UCL	0.0814
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.502
		SD in Log Scale	3.463
		Mean in Original Scale	0.0701
		SD in Original Scale	0.247
		95% t UCL	0.142
		95% Percentile Bootstrap UCL	0.145
		95% BCA Bootstrap UCL	0.19
		95% H-UCL	9.579
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.471	Data appear Normal at 5% Significance Level	
Theta Star	1.229		
nu star	3.767		
A-D Test Statistic	0.202	Nonparametric Statistics	
5% A-D Critical Value	0.665	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.665	Mean	0.125
5% K-S Critical Value	0.401	SD	0.228
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0452
		95% KM (t) UCL	0.202
Assuming Gamma Distribution		95% KM (z) UCL	0.2
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.302
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.207
Maximum	1.3	95% KM (BCA) UCL	N/A
Mean	0.0681	95% KM (Percentile Bootstrap) UCL	0.671
Median	1.00E-06	95% KM (Chebyshev) UCL	0.323
SD	0.248	97.5% KM (Chebyshev) UCL	0.408
k star	0.098	99% KM (Chebyshev) UCL	0.575
Theta star	0.695		
Nu star	6.664	Potential UCLs to Use	
AppChi2	1.988	95% KM (t) UCL	0.202
95% Gamma Approximate UCL	0.228	95% KM (Percentile Bootstrap) UCL	0.671
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

gamma-Chlordane

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	27
		Percent Non-Detects	79.41%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.072	Minimum Detected	-2.631
Maximum Detected	21	Maximum Detected	3.045
Mean of Detected	4.5	Mean of Detected	-0.0205
SD of Detected	7.774	SD of Detected	1.997
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.056	Maximum Non-Detect	-2.882
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	79.41%

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.661	Shapiro Wilk Test Statistic	0.954
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.947	Mean	-2.914
SD	3.79	SD	1.721
95% DL/2 (t) UCL	2.047	95% H-Stat (DL/2) UCL	0.669
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.087
		SD in Log Scale	4.642
		Mean in Original Scale	0.928
		SD in Original Scale	3.794
		95% t UCL	2.029
		95% Percentile Bootstrap UCL	2.153
		95% BCA Bootstrap UCL	2.831
		95% H-UCL	30937
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.339	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	13.26		
nu star	4.75		
A-D Test Statistic	0.486	Nonparametric Statistics	
5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.763	Mean	0.984
5% K-S Critical Value	0.33	SD	3.725
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.69
		95% KM (t) UCL	2.151
Assuming Gamma Distribution		95% KM (z) UCL	2.119
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.966
Minimum	1.00E-06	95% KM (bootstrap t) UCL	13.21
Maximum	21	95% KM (BCA) UCL	2.741
Mean	0.927	95% KM (Percentile Bootstrap) UCL	2.436
Median	1.00E-06	95% KM (Chebyshev) UCL	3.991
SD	3.795	97.5% KM (Chebyshev) UCL	5.292
k star	0.0897	99% KM (Chebyshev) UCL	7.848
Theta star	10.33		
Nu star	6.1	Potential UCLs to Use	
AppChi2	1.691	95% KM (t) UCL	2.151
95% Gamma Approximate UCL	3.342		
95% Adjusted Gamma UCL	3.578		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

4,4'-DDD

General Statistics (µg/L)			
Number of Valid Data	15	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	9
		Percent Non-Detects	60.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.09	Minimum Detected	-2.408
Maximum Detected	2.2	Maximum Detected	0.788
Mean of Detected	0.667	Mean of Detected	-0.951
SD of Detected	0.786	SD of Detected	1.168
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	10
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	66.67%

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions
It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.751	Shapiro Wilk Test Statistic	0.956
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.298	Mean	-2.159
SD	0.564	SD	1.237
95% DL/2 (t) UCL	0.554	95% H-Stat (DL/2) UCL	0.701
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.123
		SD in Log Scale	1.342
		Mean in Original Scale	0.308
		SD in Original Scale	0.56
		95% t UCL	0.563
		95% Percentile Bootstrap UCL	0.567
		95% BCA Bootstrap UCL	0.742
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.637	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.047		
nu star	7.641		
A-D Test Statistic	0.319	Nonparametric Statistics	
5% A-D Critical Value	0.714	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.714	Mean	0.321
5% K-S Critical Value	0.341	SD	0.535
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.151
		95% KM (t) UCL	0.587
Assuming Gamma Distribution		95% KM (z) UCL	0.569
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.557
Minimum	1.00E-12	95% KM (bootstrap t) UCL	0.902
Maximum	2.236	95% KM (BCA) UCL	0.831
Mean	0.814	95% KM (Percentile Bootstrap) UCL	0.669
Median	0.62	95% KM (Chebyshev) UCL	0.98
SD	0.78	97.5% KM (Chebyshev) UCL	1.265
k star	0.289	99% KM (Chebyshev) UCL	1.825
Theta star	2.815		
Nu star	8.671	Potential UCLs to Use	
AppChi2	3.129	95% KM (t) UCL	0.587
95% Gamma Approximate UCL	2.254		
95% Adjusted Gamma UCL	2.581		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

4,4'-DDE

General Statistics (µg/L)			
Number of Valid Data	31	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	23
		Percent Non-Detects	74.19%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.085	Minimum Detected	-2.465
Maximum Detected	9.8	Maximum Detected	2.282
Mean of Detected	2.462	Mean of Detected	-0.239
SD of Detected	3.567	SD of Detected	1.755
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	24
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	77.42%

Warning: There are only 8 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.725	Shapiro Wilk Test Statistic	0.942
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.673	Mean	-2.275
SD	2.03	SD	1.486
95% DL/2 (t) UCL	1.292	95% H-Stat (DL/2) UCL	0.712
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.757
		SD in Log Scale	2.174
		Mean in Original Scale	0.681
		SD in Original Scale	2.028
		95% t UCL	1.299
		95% Percentile Bootstrap UCL	1.33
		95% BCA Bootstrap UCL	1.682
		95% H-UCL	3.406
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.427	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5.77		
nu star	6.827		
A-D Test Statistic	0.375	Nonparametric Statistics	
5% A-D Critical Value	0.759	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.759	Mean	0.698
5% K-S Critical Value	0.308	SD	1.989
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.382
		95% KM (t) UCL	1.346
Assuming Gamma Distribution		95% KM (z) UCL	1.326
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.293
Minimum	1.00E-06	95% KM (bootstrap t) UCL	4.008
Maximum	9.8	95% KM (BCA) UCL	1.715
Mean	0.674	95% KM (Percentile Bootstrap) UCL	1.485
Median	1.00E-06	95% KM (Chebyshev) UCL	2.363
SD	2.036	97.5% KM (Chebyshev) UCL	3.083
k star	0.103	99% KM (Chebyshev) UCL	4.498
Theta star	6.521		
Nu star	6.412	Potential UCLs to Use	
AppChi2	1.854	95% KM (t) UCL	1.346
95% Gamma Approximate UCL	2.333		
95% Adjusted Gamma UCL	2.512		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

4,4'-DDT

General Statistics (µg/L)			
Number of Valid Data	29	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	21
		Percent Non-Detects	72.41%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.13	Minimum Detected	-2.04
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	3.179	Mean of Detected	-0.0646
SD of Detected	5.763	SD of Detected	1.665
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	21
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	8
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	72.41%

Warning: There are only 8 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.599	Shapiro Wilk Test Statistic	0.95
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.913	Mean	-2.181
SD	3.214	SD	1.569
95% DL/2 (t) UCL	1.929	95% H-Stat (DL/2) UCL	1.013
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.814
		SD in Log Scale	3.782
		Mean in Original Scale	0.883
		SD in Original Scale	3.222
		95% t UCL	1.901
		95% Percentile Bootstrap UCL	2.003
		95% BCA Bootstrap UCL	3.004
		95% H-UCL	1402
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.407	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.815		
nu star	6.508		
A-D Test Statistic	0.519	Nonparametric Statistics	
5% A-D Critical Value	0.761	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.761	Mean	0.971
5% K-S Critical Value	0.309	SD	3.142
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.624
		95% KM (t) UCL	2.032
Assuming Gamma Distribution		95% KM (z) UCL	1.997
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.956
Minimum	1.00E-06	95% KM (bootstrap t) UCL	7.714
Maximum	17	95% KM (BCA) UCL	2.266
Mean	0.877	95% KM (Percentile Bootstrap) UCL	2.112
Median	1.00E-06	95% KM (Chebyshev) UCL	3.69
SD	3.224	97.5% KM (Chebyshev) UCL	4.867
k star	0.0982	99% KM (Chebyshev) UCL	7.178
Theta star	8.931		
Nu star	5.695	Potential UCLs to Use	
AppChi2	1.486	95% KM (t) UCL	2.032
95% Gamma Approximate UCL (Use when n >= 40)	3.361		
95% Adjusted Gamma UCL (Use when n < 40)	3.665		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Dieldrin

General Statistics (µg/L)			
Number of Valid Data	31	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	27
		Percent Non-Detects	87.10%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.19	Minimum Detected	-1.661
Maximum Detected	3.1	Maximum Detected	1.131
Mean of Detected	0.96	Mean of Detected	-0.797
SD of Detected	1.429	SD of Detected	1.315
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.10%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.67	Shapiro Wilk Test Statistic	0.781
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.168	Mean	-2.697
SD	0.548	SD	0.852
95% DL/2 (t) UCL	0.335	95% H-Stat (DL/2) UCL	0.138
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.312
		SD in Log Scale	3.826
		Mean in Original Scale	0.127
		SD in Original Scale	0.557
		95% t UCL	0.297
		95% Percentile Bootstrap UCL	0.321
		95% BCA Bootstrap UCL	0.519
		95% H-UCL	111
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.363	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2.643		
nu star	2.906		
A-D Test Statistic	0.692	Nonparametric Statistics	
5% A-D Critical Value	0.67	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.67	Mean	0.289
5% K-S Critical Value	0.405	SD	0.514
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	0.107
		95% KM (t) UCL	0.47
Assuming Gamma Distribution		95% KM (z) UCL	0.465
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.441
Minimum	1.00E-06	95% KM (bootstrap t) UCL	2.046
Maximum	3.1	95% KM (BCA) UCL	3.1
Mean	0.124	95% KM (Percentile Bootstrap) UCL	0.616
Median	1.00E-06	95% KM (Chebyshev) UCL	0.754
SD	0.558	97.5% KM (Chebyshev) UCL	0.955
k star	0.0962	99% KM (Chebyshev) UCL	1.35
Theta star	1.288		
Nu star	5.965	Potential UCLs to Use	
AppChi2	1.622	95% KM (t) UCL	0.47
95% Gamma Approximate UCL	0.456		
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Endosulfan II

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	29
		Percent Non-Detects	85.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.17	Minimum Detected	-1.772
Maximum Detected	8.5	Maximum Detected	2.14
Mean of Detected	3.076	Mean of Detected	0.00787
SD of Detected	3.879	SD of Detected	1.851
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	29
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	85.29%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.794	Shapiro Wilk Test Statistic	0.852
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.496	Mean	-2.54
SD	1.734	SD	1.253
95% DL/2 (t) UCL	0.999	95% H-Stat (DL/2) UCL	0.317
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-8.271
		SD in Log Scale	5.088
		Mean in Original Scale	0.455
		SD in Original Scale	1.745
		95% t UCL	0.961
		95% Percentile Bootstrap UCL	0.972
		95% BCA Bootstrap UCL	1.29
		95% H-UCL	309359
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.357	Data appear Normal at 5% Significance Level	
Theta Star	8.612		
nu star	3.572		
A-D Test Statistic	0.514	Nonparametric Statistics	
5% A-D Critical Value	0.708	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.708	Mean	0.597
5% K-S Critical Value	0.37	SD	1.682
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.323
		95% KM (t) UCL	1.143
Assuming Gamma Distribution		95% KM (z) UCL	1.128
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.071
Minimum	1.00E-06	95% KM (bootstrap t) UCL	6.905
Maximum	8.5	95% KM (BCA) UCL	6.129
Mean	0.452	95% KM (Percentile Bootstrap) UCL	1.773
Median	1.00E-06	95% KM (Chebyshev) UCL	2.003
SD	1.746	97.5% KM (Chebyshev) UCL	2.612
k star	0.0892	99% KM (Chebyshev) UCL	3.807
Theta star	5.072		
Nu star	6.065	Potential UCLs to Use	
AppChi2	1.673	95% KM (t) UCL	1.143
95% Gamma Approximate UCL	1.64	95% KM (Percentile Bootstrap) UCL	1.773
95% Adjusted Gamma UCL	1.756		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Endosulfan sulfate

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	29
		Percent Non-Detects	85.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.078	Minimum Detected	-2.551
Maximum Detected	3.1	Maximum Detected	1.131
Mean of Detected	1.19	Mean of Detected	-0.81
SD of Detected	1.447	SD of Detected	1.71
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.24%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.781	Shapiro Wilk Test Statistic	0.86
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.218	Mean	-2.66
SD	0.649	SD	0.982
95% DL/2 (t) UCL	0.407	95% H-Stat (DL/2) UCL	0.171
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.801
		SD in Log Scale	1.495
		Mean in Original Scale	0.239
		SD in Original Scale	0.648
		95% t UCL	0.427
		95% Percentile Bootstrap UCL	0.434
		95% BCA Bootstrap UCL	0.546
		95% H-UCL	0.417
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.383	Data appear Normal at 5% Significance Level	
Theta Star	3.105		
nu star	3.831		
A-D Test Statistic	0.534	Nonparametric Statistics	
5% A-D Critical Value	0.705	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.705	Mean	0.241
5% K-S Critical Value	0.369	SD	0.634
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.121
		95% KM (t) UCL	0.447
Assuming Gamma Distribution		95% KM (z) UCL	0.441
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.404
Minimum	1.00E-06	95% KM (bootstrap t) UCL	2.53
Maximum	3.1	95% KM (BCA) UCL	3.1
Mean	0.315	95% KM (Percentile Bootstrap) UCL	0.691
Median	1.00E-06	95% KM (Chebyshev) UCL	0.771
SD	0.682	97.5% KM (Chebyshev) UCL	1
k star	0.123	99% KM (Chebyshev) UCL	1.45
Theta star	2.547		
Nu star	8.396	Potential UCLs to Use	
AppChi2	2.966	95% KM (t) UCL	0.447
95% Gamma Approximate UCL	0.89	95% KM (Percentile Bootstrap) UCL	0.691
95% Adjusted Gamma UCL	0.94		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Endrin aldehyde

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	30
		Percent Non-Detects	88.24%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	5.7	Maximum Detected	1.74
Mean of Detected	2.495	Mean of Detected	-0.104
SD of Detected	2.762	SD of Detected	1.951
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.11	Maximum Non-Detect	-2.207
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.24%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.865	Shapiro Wilk Test Statistic	0.874
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.338	Mean	-2.641
SD	1.154	SD	1.11
95% DL/2 (t) UCL	0.673	95% H-Stat (DL/2) UCL	0.217
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-10.12
		SD in Log Scale	5.741
		Mean in Original Scale	0.295
		SD in Original Scale	1.166
		95% t UCL	0.633
		95% Percentile Bootstrap UCL	0.628
		95% BCA Bootstrap UCL	0.802
		95% H-UCL	14099972
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.318	Data appear Normal at 5% Significance Level	
Theta Star	7.842		
nu star	2.545		
A-D Test Statistic	0.432	Nonparametric Statistics	
5% A-D Critical Value	0.676	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.676	Mean	0.391
5% K-S Critical Value	0.408	SD	1.124
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.223
		95% KM (t) UCL	0.767
Assuming Gamma Distribution		95% KM (z) UCL	0.757
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.666
Minimum	1.00E-06	95% KM (bootstrap t) UCL	0.686
Maximum	5.7	95% KM (BCA) UCL	N/A
Mean	0.294	95% KM (Percentile Bootstrap) UCL	4.006
Median	1.00E-06	95% KM (Chebyshev) UCL	1.361
SD	1.166	97.5% KM (Chebyshev) UCL	1.781
k star	0.0893	99% KM (Chebyshev) UCL	2.605
Theta star	3.289		
Nu star	6.07	Potential UCLs to Use	
AppChi2	1.676	95% KM (t) UCL	0.767
95% Gamma Approximate UCL	1.063	95% KM (Percentile Bootstrap) UCL	4.006
95% Adjusted Gamma UCL	N/A		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Heptachlor

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	25
		Percent Non-Detects	73.53%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0615	Minimum Detected	-2.789
Maximum Detected	5.1	Maximum Detected	1.629
Mean of Detected	1.709	Mean of Detected	-0.285
SD of Detected	1.95	SD of Detected	1.528
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.056	Maximum Non-Detect	-2.882
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	25
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	73.53%

Warning: There are only 9 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.946
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.471	Mean	-2.774
SD	1.221	SD	1.692
95% DL/2 (t) UCL	0.826	95% H-Stat (DL/2) UCL	0.712
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.48
		SD in Log Scale	3.172
		Mean in Original Scale	0.459
		SD in Original Scale	1.225
		95% t UCL	0.815
		95% Percentile Bootstrap UCL	0.803
		95% BCA Bootstrap UCL	0.898
		95% H-UCL	41.87
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.562	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.043		
nu star	10.11		
A-D Test Statistic	0.341	Nonparametric Statistics	
5% A-D Critical Value	0.753	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.753	Mean	0.498
5% K-S Critical Value	0.29	SD	1.193
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.217
		95% KM (t) UCL	0.865
Assuming Gamma Distribution		95% KM (z) UCL	0.855
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.808
Minimum	1.00E-06	95% KM (bootstrap t) UCL	1.192
Maximum	5.1	95% KM (BCA) UCL	1.105
Mean	0.452	95% KM (Percentile Bootstrap) UCL	0.96
Median	1.00E-06	95% KM (Chebyshev) UCL	1.444
SD	1.228	97.5% KM (Chebyshev) UCL	1.853
k star	0.0993	99% KM (Chebyshev) UCL	2.657
Theta star	4.554		
Nu star	6.755	Potential UCLs to Use	
AppChi2	2.037	95% KM (t) UCL	0.865
95% Gamma Approximate UCL	1.5		
95% Adjusted Gamma UCL	1.599		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

2,3,7,8-TCDD Toxic Equivalence TEQ (pg/L)

General Statistics - Data are in pg/L.			
Number of Valid Observations	10	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	8.10E-04	Minimum of Log Data	-7.118
Maximum	54	Maximum of Log Data	3.989
Mean	17.7	Mean of log Data	1.279
Median	10.66	SD of log Data	3.294
SD	19.66		
Std. Error of Mean	6.218		
Coefficient of Variation	1.111		
Skewness	0.912		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	29.09	95% H-UCL	10315140
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	720.3
95% Adjusted-CLT UCL (Chen-1995)	29.84	97.5% Chebyshev (MVUE) UCL	968.1
95% Modified-t UCL (Johnson-1978)	29.39	99% Chebyshev (MVUE) UCL	1455
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.354	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	49.93		
MLE of Mean	17.7		
MLE of Standard Deviation	29.72		
nu star	7.088		
Approximate Chi Square Value (.05)	2.219	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	27.92
Adjusted Chi Square Value	1.776	95% Jackknife UCL	29.09
		95% Standard Bootstrap UCL	27.32
Anderson-Darling Test Statistic	0.368	95% Bootstrap-t UCL	32.27
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	27.05
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	28.16
Kolmogorov-Smirnov 5% Critical Value	0.284	95% BCA Bootstrap UCL	29.23
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	44.8
		97.5% Chebyshev(Mean, Sd) UCL	56.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	79.57
95% Approximate Gamma UCL	56.52		
95% Adjusted Gamma UCL	70.6		
Potential UCL to Use		Use 95% Adjusted Gamma UCL (pg/L)	70.6
Recommended UCL exceeds the maximum observation		(µg/L)	7.06E-05

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Aluminium

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	26
Number of Distinct Detected Data	25	Number of Non-Detect Data	8
		Percent Non-Detects	23.53%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	71.3	Minimum Detected	4.267
Maximum Detected	6210	Maximum Detected	8.734
Mean of Detected	754.7	Mean of Detected	5.885
SD of Detected	1279	SD of Detected	1.13
Minimum Non-Detect	200	Minimum Non-Detect	5.298
Maximum Non-Detect	200	Maximum Non-Detect	5.298
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.544	Shapiro Wilk Test Statistic	0.938
5% Shapiro Wilk Critical Value	0.92	5% Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	600.6	Mean	5.584
SD	1149	SD	1.127
95% DL/2 (t) UCL	934	95% H-Stat (DL/2) UCL	836.9
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	5.645
		SD in Log Scale	1.112
		Mean in Original Scale	612.4
		SD in Original Scale	1144
		95% t UCL	944.4
		95% Percentile Bootstrap UCL	978.5
		95% BCA Bootstrap UCL	1125
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.734	Data appear Lognormal at 5% Significance Level	
Theta Star	1029		
nu star	38.15		
A-D Test Statistic	1.509	Nonparametric Statistics	
5% A-D Critical Value	0.782	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.782	Mean	610.3
5% K-S Critical Value	0.178	SD	1128
Data not Gamma Distributed at 5% Significance Level		SE of Mean	197.3
		95% KM (t) UCL	944.2
Assuming Gamma Distribution		95% KM (z) UCL	934.8
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	942.6
Minimum	1.00E-12	95% KM (bootstrap t) UCL	1369
Maximum	6210	95% KM (BCA) UCL	975.5
Mean	669.6	95% KM (Percentile Bootstrap) UCL	959.5
Median	287.8	95% KM (Chebyshev) UCL	1470
SD	1143	97.5% KM (Chebyshev) UCL	1842
k star	0.209	99% KM (Chebyshev) UCL	2573
Theta star	3209		
Nu star	14.19	Potential UCLs to Use	
AppChi2	6.701	97.5% KM (Chebyshev) UCL	1842
95% Gamma Approximate UCL	1418		
95% Adjusted Gamma UCL	1474		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics (µg/L)			
Number of Valid Observations	34	Number of Distinct Observations	23
Raw Statistics		Log-transformed Statistics	
Minimum	0.68	Minimum of Log Data	-0.386
Maximum	829	Maximum of Log Data	6.72
Mean	33.65	Mean of log Data	1.317
Median	1.85	SD of log Data	1.576
SD	142		
Coefficient of Variation	4.22		
Skewness	5.649		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.245	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.933	Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.87	95% H-UCL	31.32
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.3
95% Adjusted-CLT UCL (Chen-1995)	98.93	97.5% Chebyshev (MVUE) UCL	38.23
95% Modified-t UCL (Johnson-1978)	78.81	99% Chebyshev (MVUE) UCL	53.79
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.304	Data do not follow a Discernable Distribution (0.05)	
Theta Star	110.8		
MLE of Mean	33.65		
MLE of Standard Deviation	61.06		
nu star	20.66		
Approximate Chi Square Value (.05)	11.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0422	95% CLT UCL	73.72
Adjusted Chi Square Value	10.99	95% Jackknife UCL	74.87
		95% Standard Bootstrap UCL	73.64
Anderson-Darling Test Statistic	5.919	95% Bootstrap-t UCL	372.1
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	278.4
Kolmogorov-Smirnov Test Statistic	0.315	95% Percentile Bootstrap UCL	81.11
Kolmogorov-Smirnov 5% Critical Value	0.164	95% BCA Bootstrap UCL	118.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	139.8
		97.5% Chebyshev(Mean, Sd) UCL	185.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	276
95% Approximate Gamma UCL	61.32		
95% Adjusted Gamma UCL	63.22		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	139.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

Number of Valid Observations	34	Number of Distinct Observations	34
Raw Statistics		Log-transformed Statistics	
Minimum	70.6	Minimum of Log Data	4.257
Maximum	2650	Maximum of Log Data	7.882
Mean	615.4	Mean of log Data	5.966
Median	418.5	SD of log Data	0.977
SD	651.5		
Coefficient of Variation	1.059		
Skewness	2.015		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.743	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.933	Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	804.5	95% H-UCL	948.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1134
95% Adjusted-CLT UCL (Chen-1995)	840.4	97.5% Chebyshev (MVUE) UCL	1358
95% Modified-t UCL (Johnson-1978)	810.9	99% Chebyshev (MVUE) UCL	1798
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.146	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	537.2		
MLE of Mean	615.4		
MLE of Standard Deviation	575		
nu star	77.9		
Approximate Chi Square Value (.05)	58.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0422	95% CLT UCL	799.2
Adjusted Chi Square Value	57.74	95% Jackknife UCL	804.5
		95% Standard Bootstrap UCL	796.6
Anderson-Darling Test Statistic	0.652	95% Bootstrap-t UCL	893.9
Anderson-Darling 5% Critical Value	0.771	95% Hall's Bootstrap UCL	889.7
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	808.3
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	832.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1102
		97.5% Chebyshev(Mean, Sd) UCL	1313
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1727
95% Approximate Gamma UCL	818.5		
95% Adjusted Gamma UCL	830.3		
Potential UCL to Use		Use 95% Approximate Gamma UCL	818.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	5
Number of Distinct Detected Data	4	Number of Non-Detect Data	29
		Percent Non-Detects	85.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	16.8	Maximum Detected	2.821
Mean of Detected	4.24	Mean of Detected	0.639
SD of Detected	7.022	SD of Detected	1.222
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.562	Shapiro Wilk Test Statistic	0.602
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.05	Mean	-0.497
SD	2.79	SD	0.64
95% DL/2 (t) UCL	1.86	95% H-Stat (DL/2) UCL	0.939
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.23
		SD in Log Scale	3.069
		Mean in Original Scale	0.658
		SD in Original Scale	2.874
		95% t UCL	1.492
		95% Percentile Bootstrap UCL	1.638
		95% BCA Bootstrap UCL	2.187
		95% H-UCL	32.08
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.431	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.841		
nu star	4.309		
A-D Test Statistic	1.238	Nonparametric Statistics	
5% A-D Critical Value	0.699	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.699	Mean	1.476
5% K-S Critical Value	0.367	SD	2.668
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.512
		95% KM (t) UCL	2.342
Assuming Gamma Distribution		95% KM (z) UCL	2.318
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.195
Minimum	1.00E-06	95% KM (bootstrap t) UCL	45.46
Maximum	16.8	95% KM (BCA) UCL	2.953
Mean	0.624	95% KM (Percentile Bootstrap) UCL	2.415
Median	1.00E-06	95% KM (Chebyshev) UCL	3.706
SD	2.881	97.5% KM (Chebyshev) UCL	4.671
k star	0.0879	99% KM (Chebyshev) UCL	6.566
Theta star	7.093		
Nu star	5.978	Potential UCLs to Use	
AppChi2	1.629	95% KM (BCA) UCL	2.953
95% Gamma Approximate UCL	2.289		
95% Adjusted Gamma UCL	2.453		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chromium

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	21
Number of Distinct Detected Data	20	Number of Non-Detect Data	1300.00%
		Percent Non-Detects	38.24%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.34	Minimum Detected	-1.079
Maximum Detected	96.8	Maximum Detected	4.573
Mean of Detected	10.3	Mean of Detected	0.821
SD of Detected	25.84	SD of Detected	1.497
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2	Maximum Non-Detect	0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.403	Shapiro Wilk Test Statistic	0.872
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.747	Mean	0.507
SD	20.63	SD	1.234
95% DL/2 (t) UCL	12.74	95% H-Stat (DL/2) UCL	6.415
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.319
		SD in Log Scale	1.432
		Mean in Original Scale	6.678
		SD in Original Scale	20.65
		95% t UCL	12.67
		95% Percentile Bootstrap UCL	13.14
		95% BCA Bootstrap UCL	16.06
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.401	Data do not follow a Discernable Distribution (0.05)	
Theta Star	25.72		
nu star	16.82		
A-D Test Statistic	2.783	Nonparametric Statistics	
5% A-D Critical Value	0.819	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.819	Mean	6.666
5% K-S Critical Value	0.202	SD	20.35
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.577
		95% KM (t) UCL	12.72
Assuming Gamma Distribution		95% KM (z) UCL	12.55
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	12.66
Minimum	1.00E-12	95% KM (bootstrap t) UCL	78.22
Maximum	96.8	95% KM (BCA) UCL	14.13
Mean	1.12E+01	95% KM (Percentile Bootstrap) UCL	12.95
Median	2.5	95% KM (Chebyshev) UCL	22.26
SD	22.08	97.5% KM (Chebyshev) UCL	29.01
k star	0.172	99% KM (Chebyshev) UCL	42.26
Theta star	65.13		
Nu star	11.71	Potential UCLs to Use	
AppChi2	5.038	97.5% KM (Chebyshev) UCL	29.01
95% Gamma Approximate UCL	26.08		
95% Adjusted Gamma UCL	27.24		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	14
Number of Distinct Detected Data	13	Number of Non-Detect Data	20
		Percent Non-Detects	58.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.17	Minimum Detected	-1.772
Maximum Detected	3.5	Maximum Detected	1.253
Mean of Detected	0.983	Mean of Detected	-0.451
SD of Detected	1.059	SD of Detected	0.926
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.938
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.699	Mean	-0.593
SD	0.707	SD	0.593
95% DL/2 (t) UCL	0.904	95% H-Stat (DL/2) UCL	0.812
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.664
		SD in Log Scale	0.801
		Mean in Original Scale	0.725
		SD in Original Scale	0.747
		95% t UCL	0.942
		95% Percentile Bootstrap UCL	0.941
		95% BCA Bootstrap UCL	1.004
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.065	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.922		
nu star	29.83		
A-D Test Statistic	0.75	Nonparametric Statistics	
5% A-D Critical Value	0.754	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.754	Mean	0.691
5% K-S Critical Value	0.234	SD	0.722
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.139
		95% KM (t) UCL	0.927
Assuming Gamma Distribution		95% KM (z) UCL	0.92
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.925
Minimum	0.17	95% KM (bootstrap t) UCL	1.041
Maximum	3.5	95% KM (BCA) UCL	0.94
Mean	0.916	95% KM (Percentile Bootstrap) UCL	0.934
Median	0.725	95% KM (Chebyshev) UCL	1.299
SD	0.721	97.5% KM (Chebyshev) UCL	1.561
k star	2.082	99% KM (Chebyshev) UCL	2.078
Theta star	0.44		
Nu star	141.6	Potential UCLs to Use	
AppChi2	115.1	95% KM (t) UCL	0.927
95% Gamma Approximate UCL	1.127		
95% Adjusted Gamma UCL	1.139		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Iron

General Statistics (µg/L)			
Number of Valid Data	34	Number of Detected Data	31
Number of Distinct Detected Data	31	Number of Non-Detect Data	3
		Percent Non-Detects	8.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	46.6	Minimum Detected	3.842
Maximum Detected	8520	Maximum Detected	9.05
Mean of Detected	1306	Mean of Detected	6.205
SD of Detected	2116	SD of Detected	1.452
Minimum Non-Detect	100	Minimum Non-Detect	4.605
Maximum Non-Detect	100	Maximum Non-Detect	4.605
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.962
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1195	Mean	6.003
SD	2050	SD	1.534
95% DL/2 (t) UCL	1790	95% H-Stat (DL/2) UCL	3058
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	734	Mean in Log Scale	6.025
SD	2495	SD in Log Scale	1.51
95% MLE (t) UCL	1458	Mean in Original Scale	1197
95% MLE (Tiku) UCL	1472	SD in Original Scale	2049
		95% t UCL	1791
		95% Percentile Bootstrap UCL	1780
		95% BCA Bootstrap UCL	2108
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.593	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2202		
nu star	36.77		
A-D Test Statistic	0.87	Nonparametric Statistics	
5% A-D Critical Value	0.798	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.798	Mean	1197
5% K-S Critical Value	0.165	SD	2019
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	351.9
		95% KM (t) UCL	1792
Assuming Gamma Distribution		95% KM (z) UCL	1775
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1791
Minimum	1.00E-12	95% KM (bootstrap t) UCL	2286
Maximum	8520	95% KM (BCA) UCL	1819
Mean	1190	95% KM (Percentile Bootstrap) UCL	1776
Median	482	95% KM (Chebyshev) UCL	2731
SD	2053	97.5% KM (Chebyshev) UCL	3394
k star	0.194	99% KM (Chebyshev) UCL	4698
Theta star	6121		
Nu star	13.22	Potential UCLs to Use	
AppChi2	6.044	95% KM (Chebyshev) UCL	2731
95% Gamma Approximate UCL	2605		
95% Adjusted Gamma UCL	2712		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Manganese

General Statistics (µg/L)			
Number of Valid Observations	34	Number of Distinct Observations	34
Raw Statistics		Log-transformed Statistics	
Minimum	23.4	Minimum of Log Data	3.153
Maximum	1660	Maximum of Log Data	7.415
Mean	466.6	Mean of log Data	5.425
Median	194	SD of log Data	1.305
SD	506.3		
Coefficient of Variation	1.085		
Skewness	1.025		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.799	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.933	Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	613.6	95% H-UCL	1016
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1123
95% Adjusted-CLT UCL (Chen-1995)	625.8	97.5% Chebyshev (MVUE) UCL	1389
95% Modified-t UCL (Johnson-1978)	616.1	99% Chebyshev (MVUE) UCL	1910
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.768	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	607.4		
MLE of Mean	466.6		
MLE of Standard Deviation	532.4		
nu star	52.24		
Approximate Chi Square Value (.05)	36.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0422	95% CLT UCL	609.5
Adjusted Chi Square Value	35.99	95% Jackknife UCL	613.6
		95% Standard Bootstrap UCL	606.7
Anderson-Darling Test Statistic	1.194	95% Bootstrap-t UCL	630.2
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	622.5
Kolmogorov-Smirnov Test Statistic	0.143	95% Percentile Bootstrap UCL	606
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	626.5
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	845.1
		97.5% Chebyshev(Mean, Sd) UCL	1009
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1331
95% Approximate Gamma UCL	665.3		
95% Adjusted Gamma UCL	677.3		
Potential UCL to Use		Use 95% Approximate Gamma UCL	665.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics (µg/L)

Number of Valid Data	34	Number of Detected Data	21
Number of Distinct Detected Data	20	Number of Non-Detect Data	13
		Percent Non-Detects	38.24%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.3	Minimum Detected	0.262
Maximum Detected	30.1	Maximum Detected	3.405
Mean of Detected	7.702	Mean of Detected	1.686
SD of Detected	7.053	SD of Detected	0.874
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

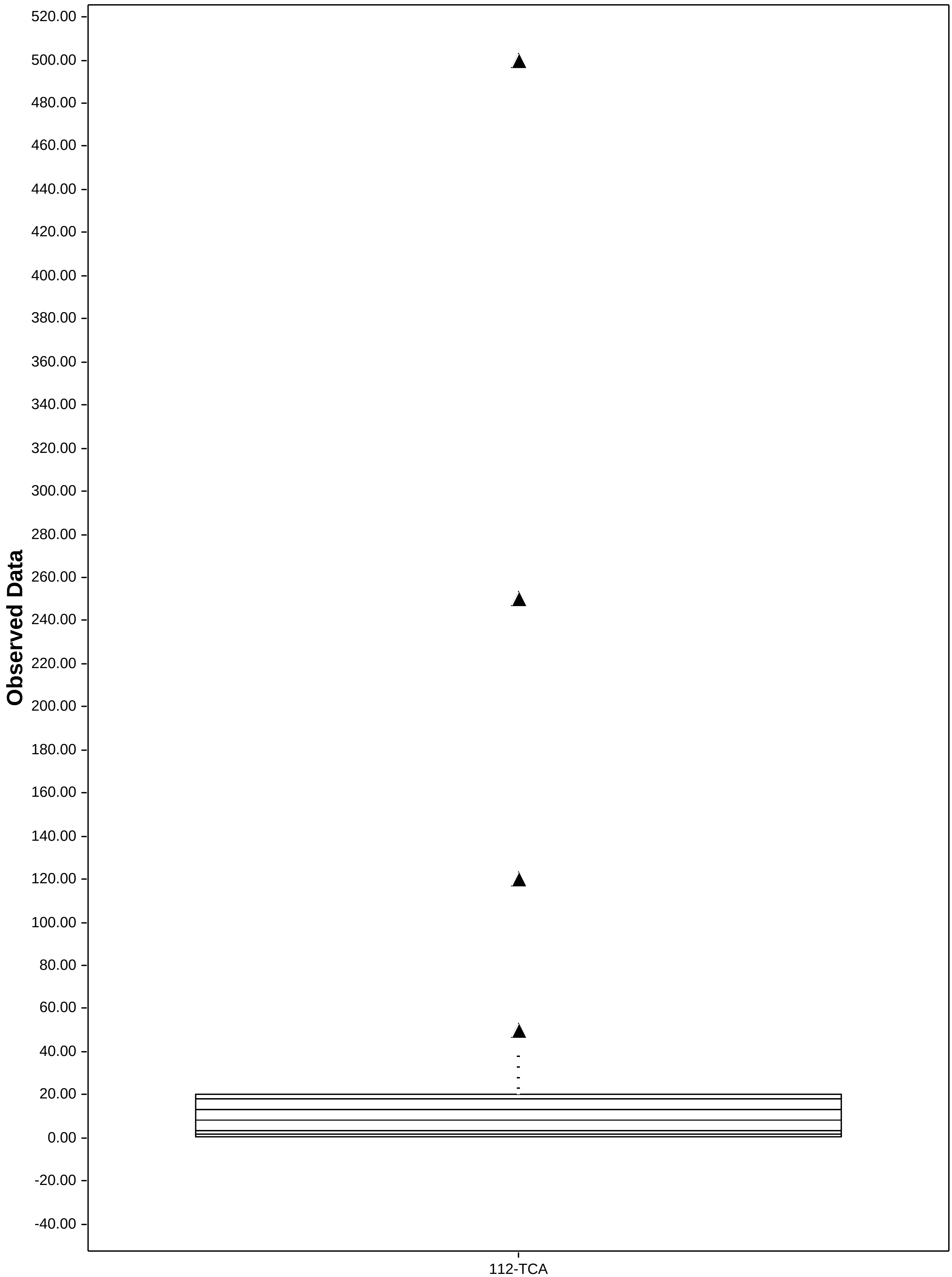
UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.969
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.713	Mean	1.392
SD	6.061	SD	0.779
95% DL/2 (t) UCL	7.472	95% H-Stat (DL/2) UCL	7.344
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.427
		SD in Log Scale	0.829
		Mean in Original Scale	5.951
		SD in Original Scale	6.01
		95% t UCL	7.695
		95% Percentile Bootstrap UCL	7.764
		95% BCA Bootstrap UCL	8.281
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.362	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5.655		
nu star	57.21		
A-D Test Statistic	0.409	Nonparametric Statistics	
5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.758	Mean	5.927
5% K-S Critical Value	0.193	SD	5.91
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.057
		95% KM (t) UCL	7.716
Assuming Gamma Distribution		95% KM (z) UCL	7.665
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.705
Minimum	1.3	95% KM (bootstrap t) UCL	8.45
Maximum	30.1	95% KM (BCA) UCL	7.985
Mean	7.866	95% KM (Percentile Bootstrap) UCL	7.751
Median	6.677	95% KM (Chebyshev) UCL	10.53
SD	5.694	97.5% KM (Chebyshev) UCL	12.53
k star	2.069	99% KM (Chebyshev) UCL	16.44
Theta star	3.802		
Nu star	140.7	Potential UCLs to Use	
AppChi2	114.3	95% KM (Percentile Bootstrap) UCL	7.751
95% Gamma Approximate UCL	9.684		
95% Adjusted Gamma UCL	9.785		

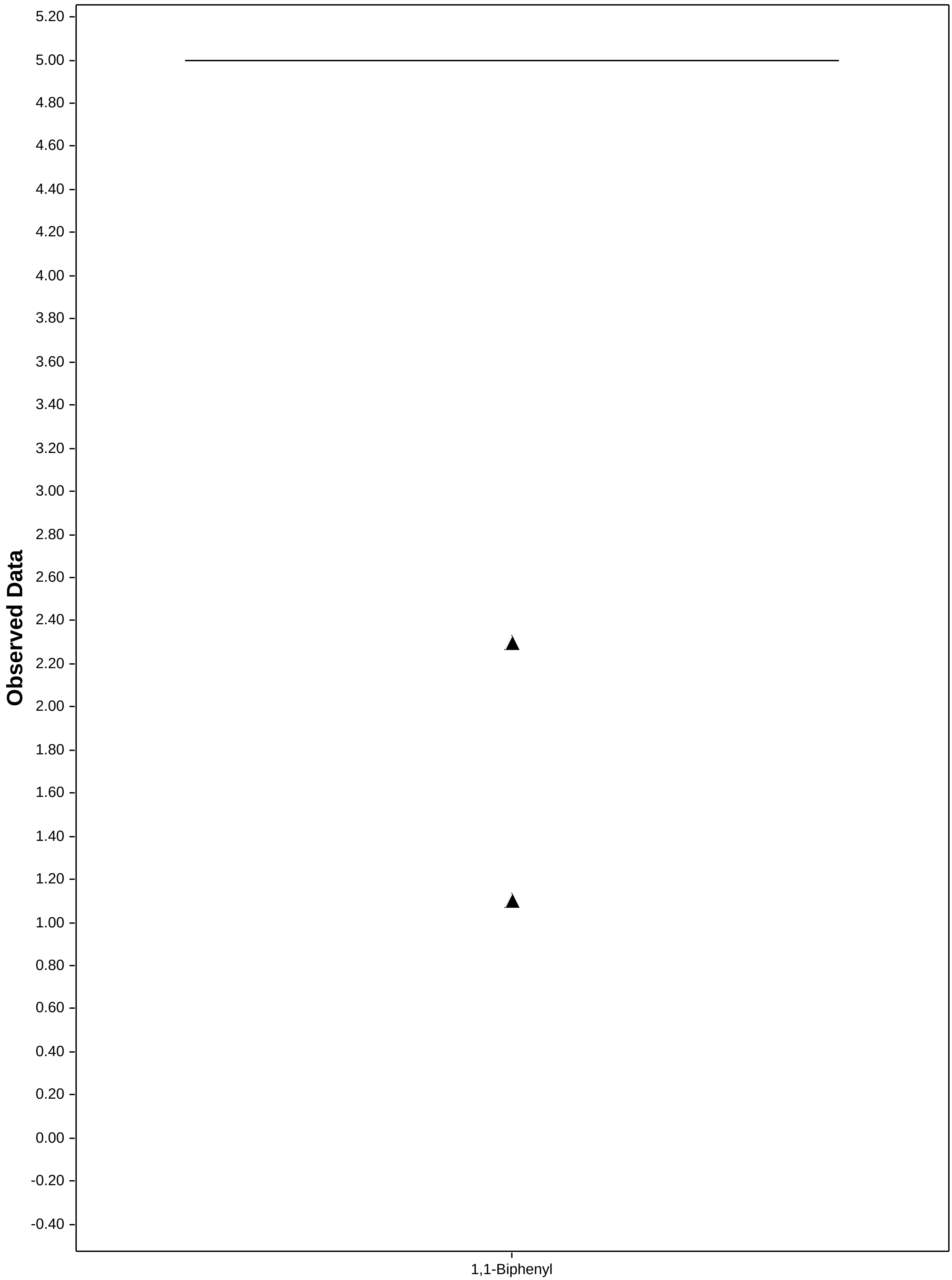
Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

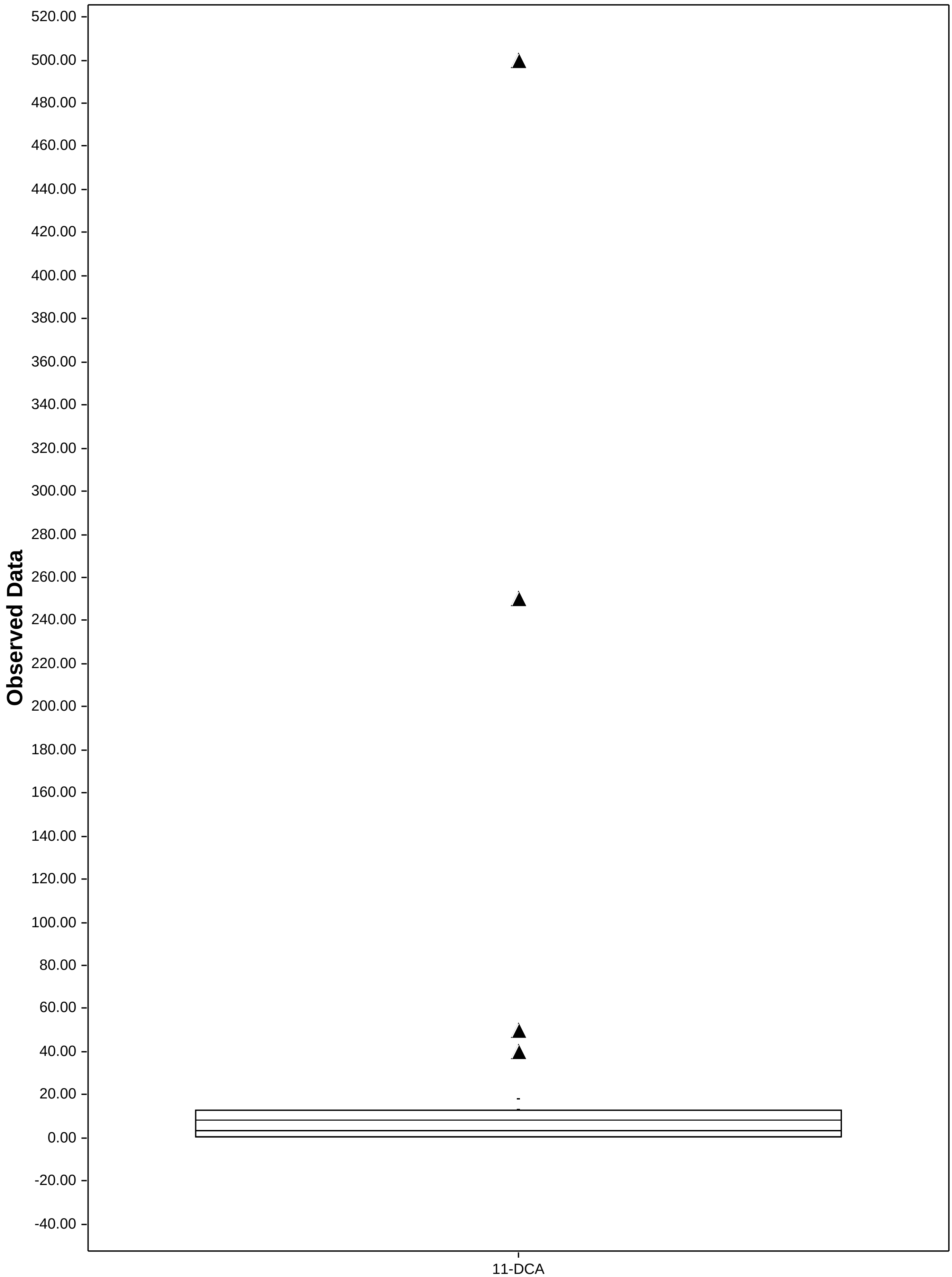
Box Plot for 112-TCA

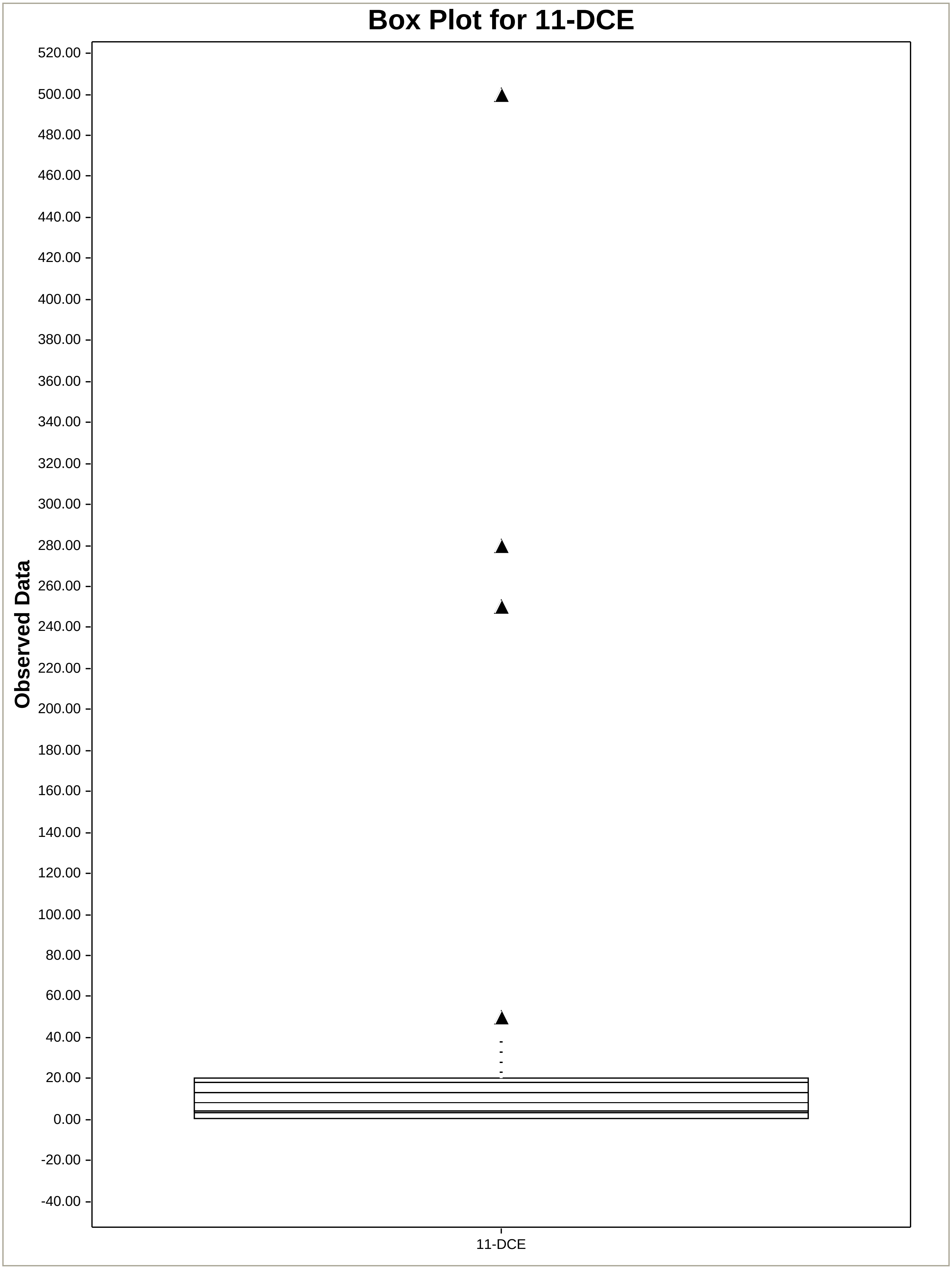


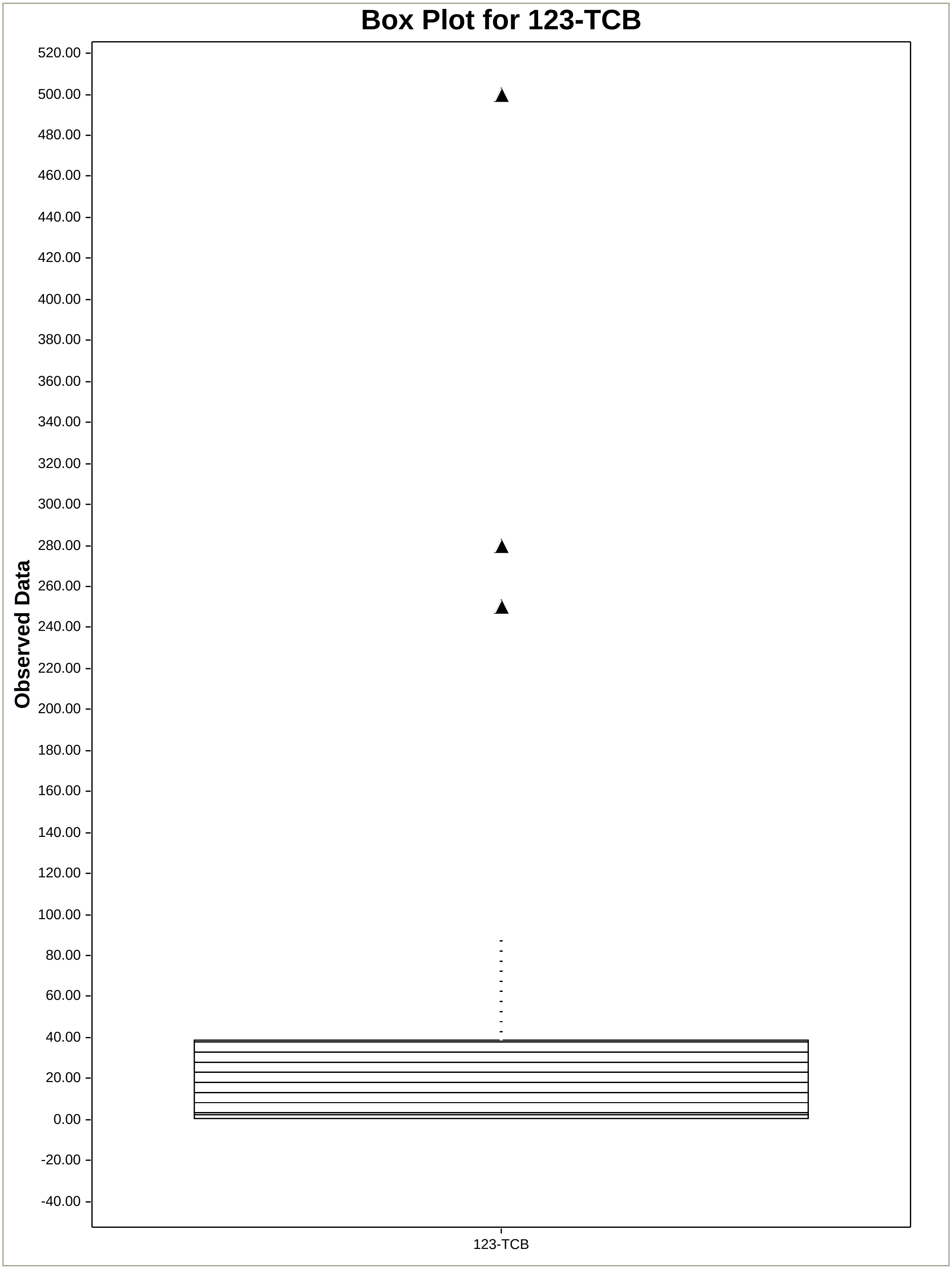
Box Plot for 1,1-Biphenyl



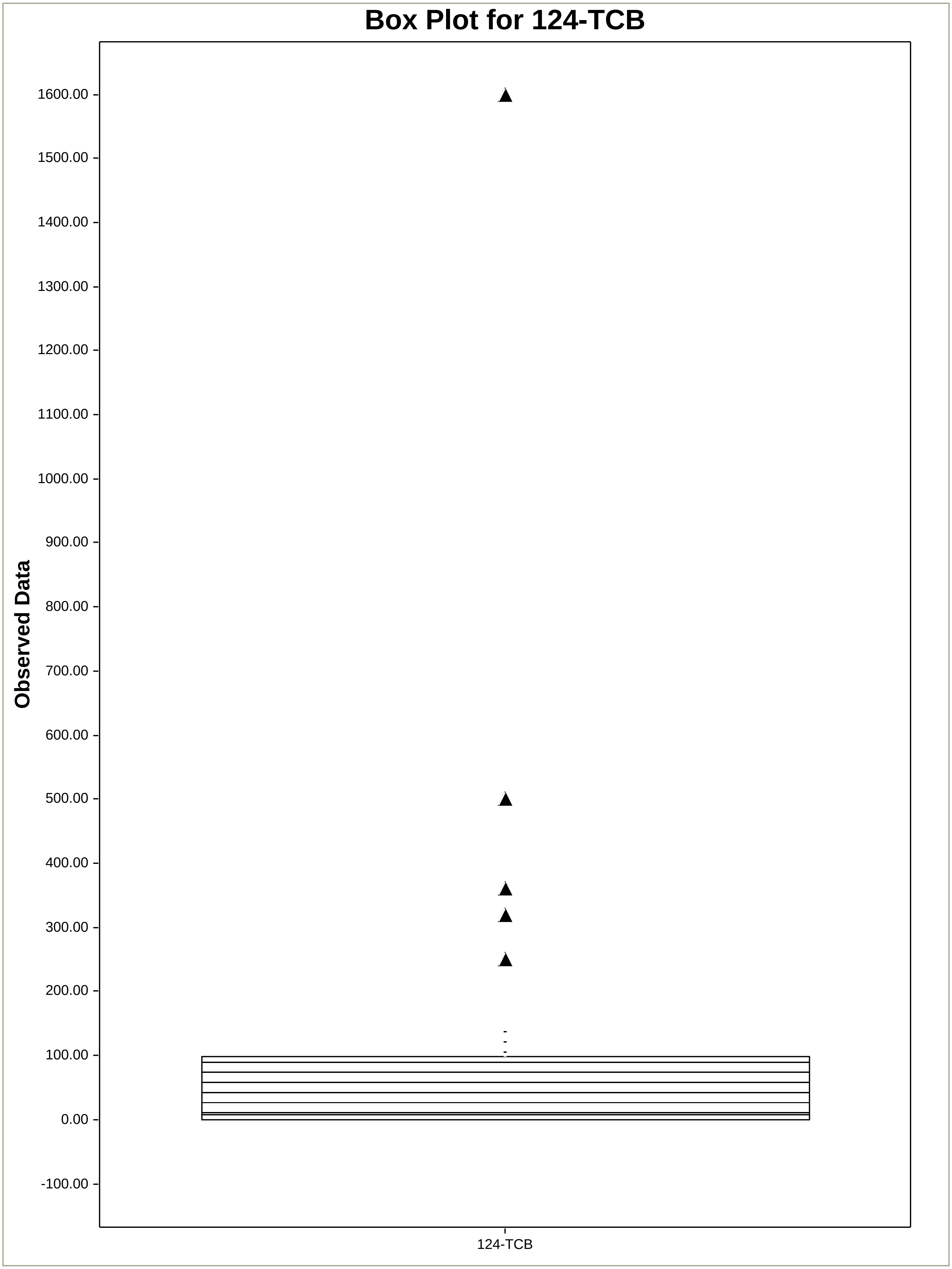
Box Plot for 11-DCA

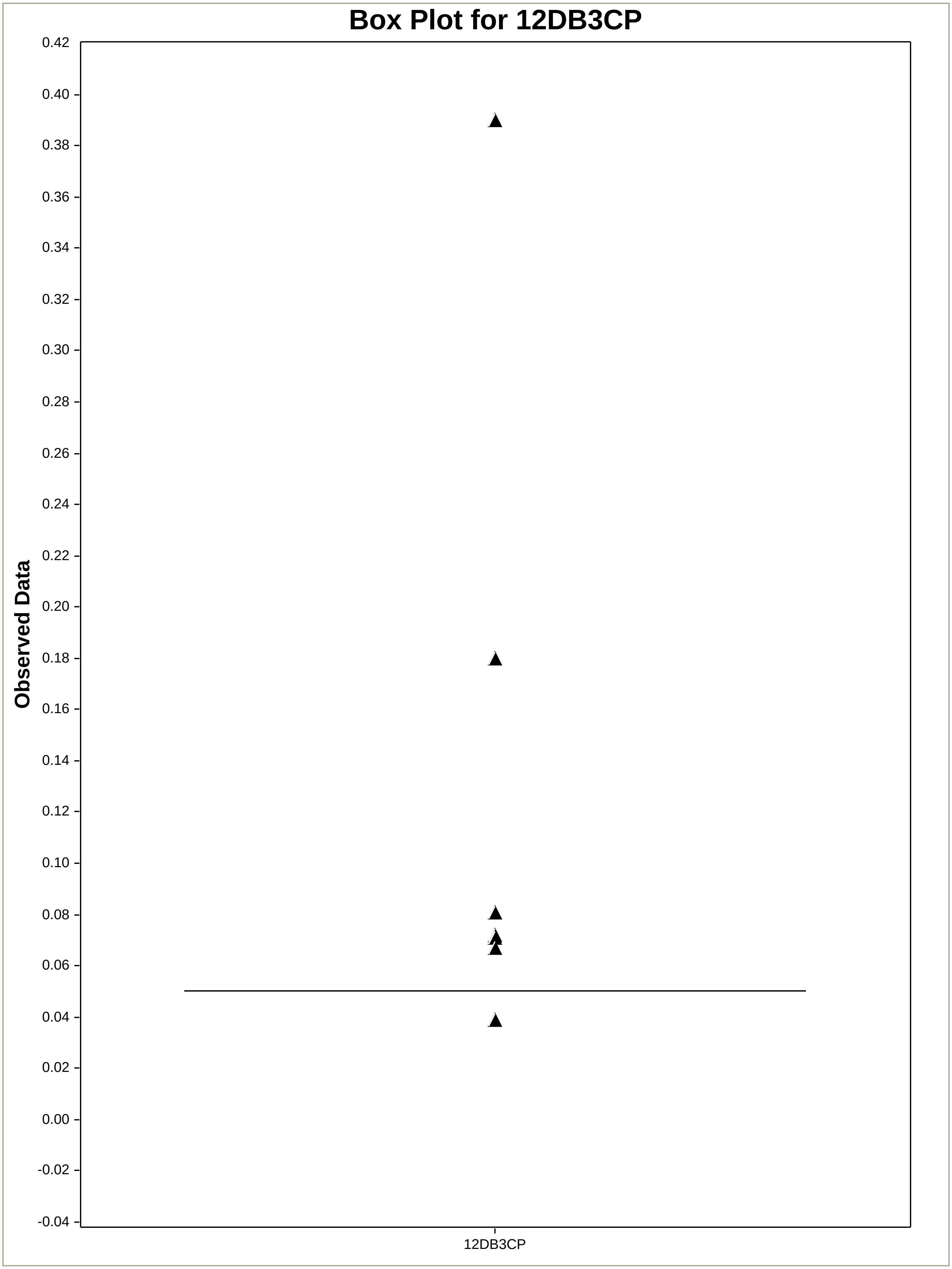



Box Plot for 11-DCE
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
11-DCE

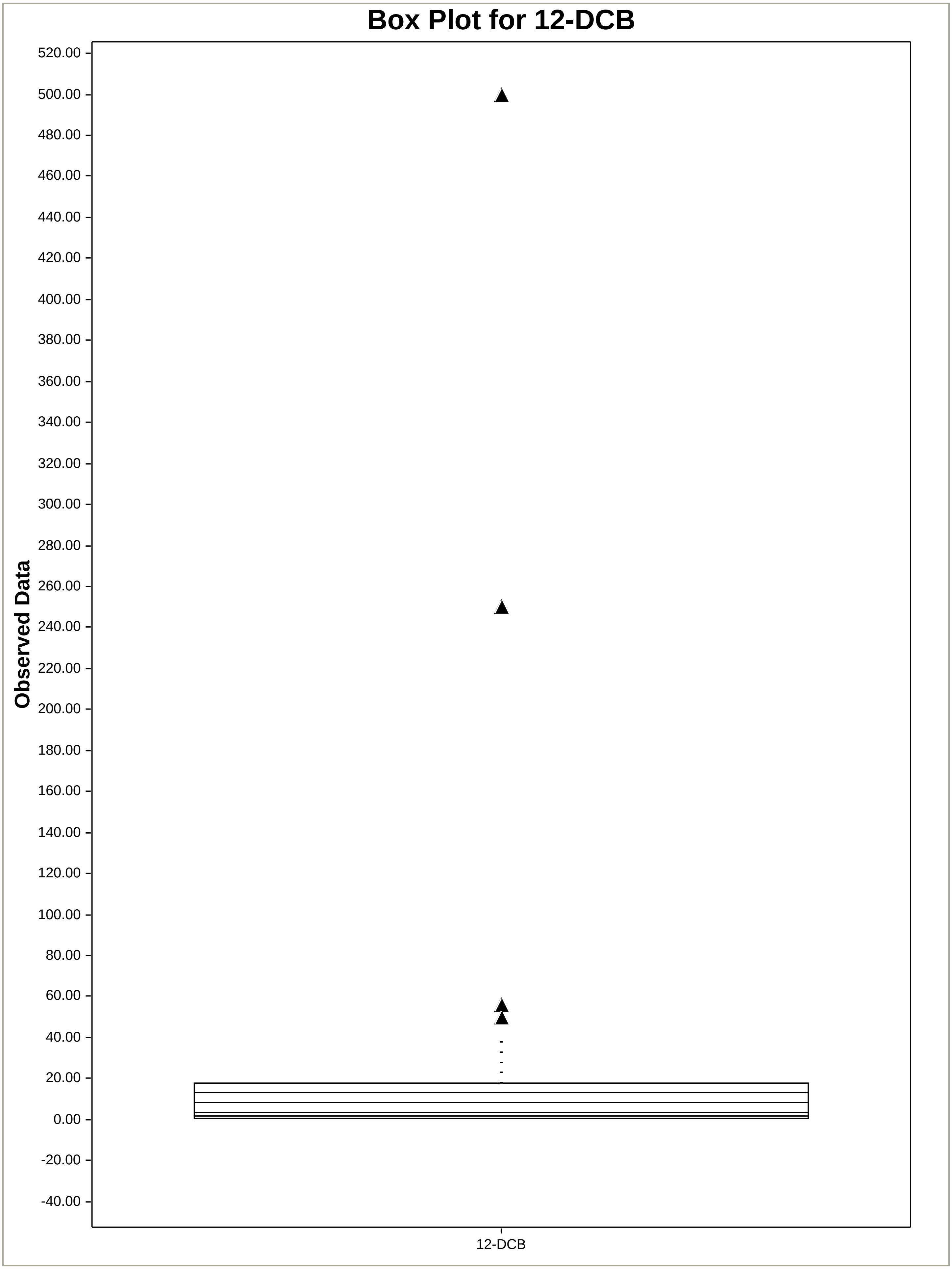


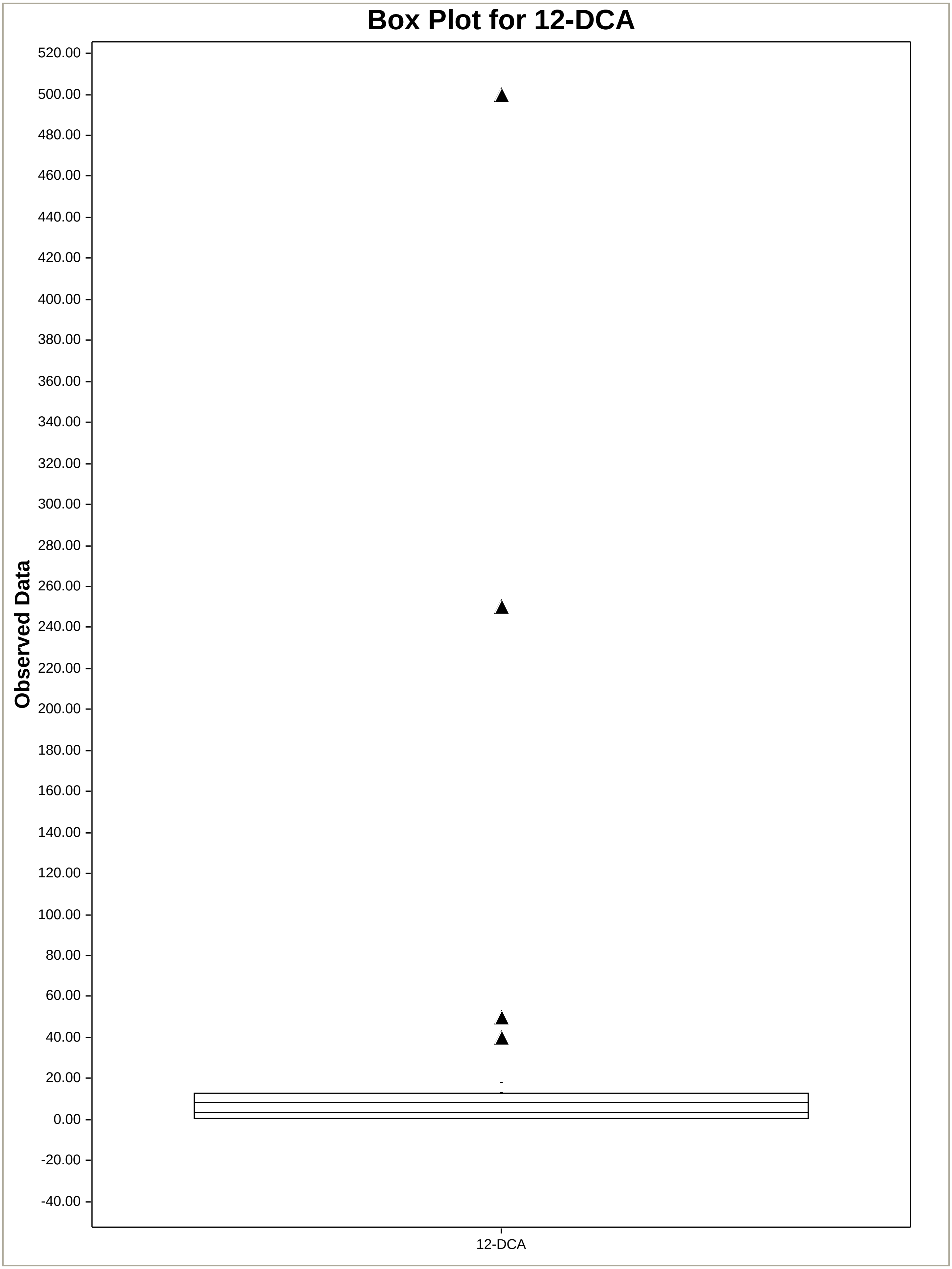
Box Plot for 123-TCB
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
123-TCB

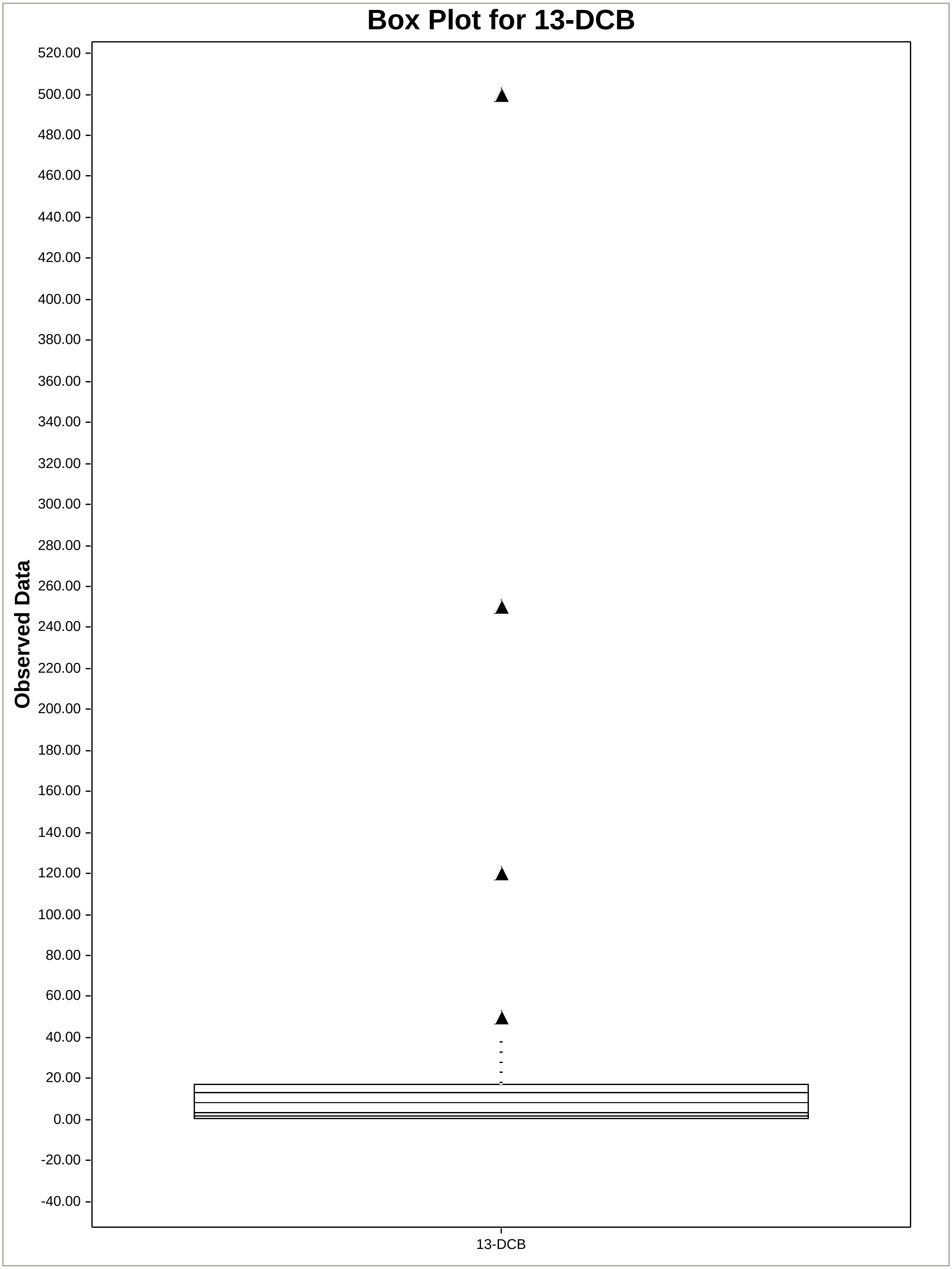

Box Plot for 124-TCB
Observed Data
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
124-TCB

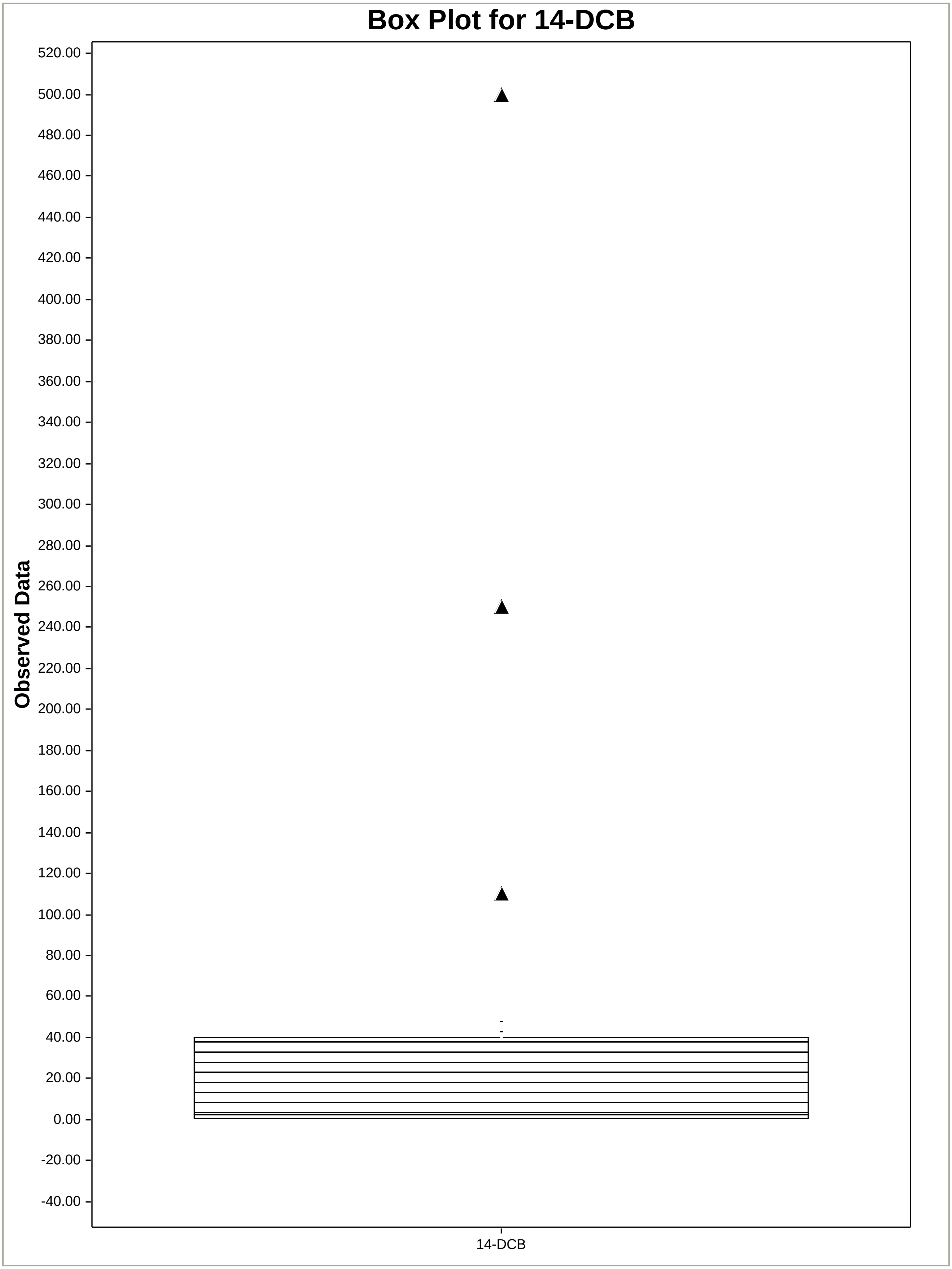


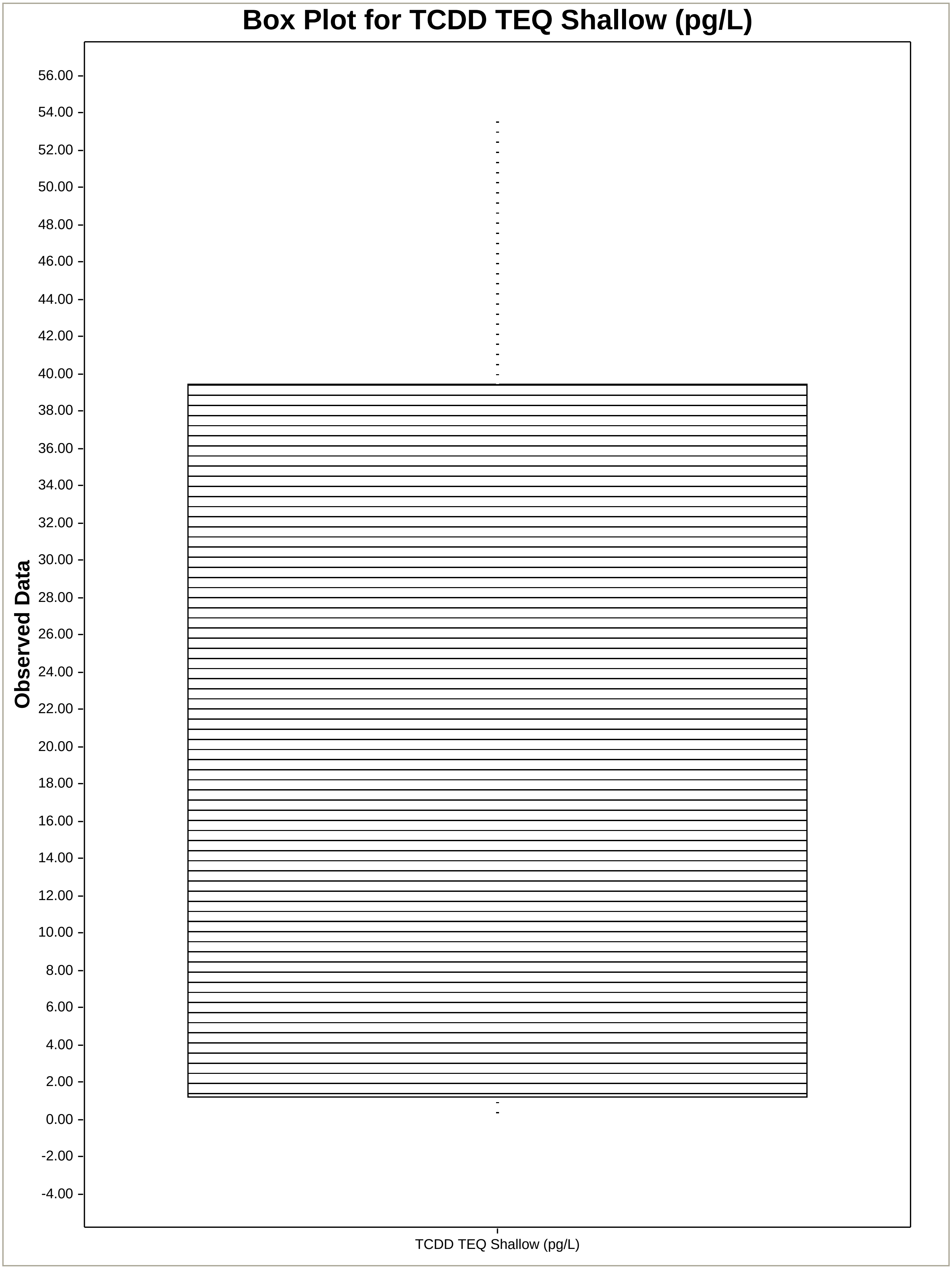
Box Plot for 12DB3CP
Observed Data
0.42
0.40
0.38
0.36
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
12DB3CP


Box Plot for 12-DCB
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
12-DCB

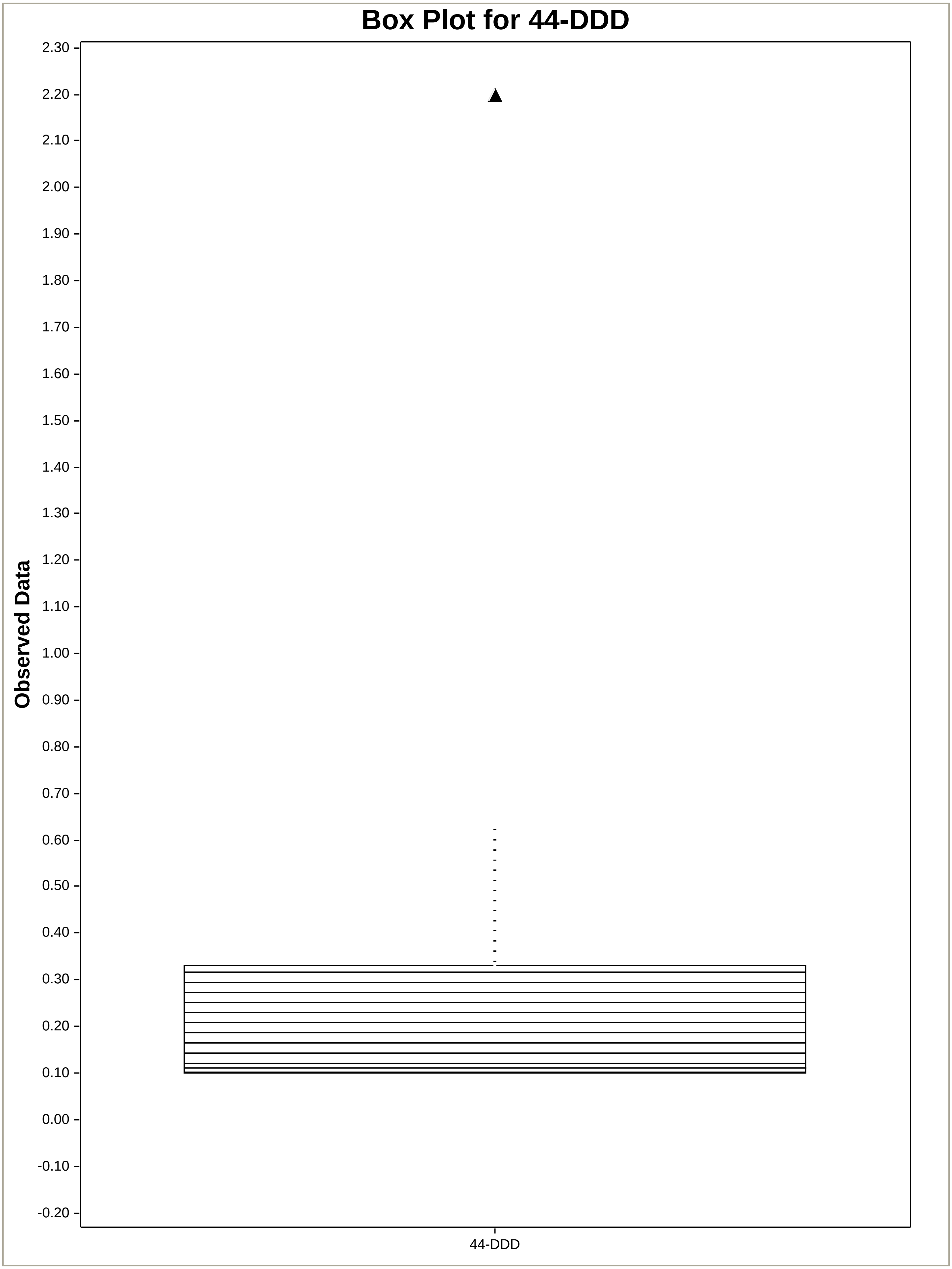

Box Plot for 12-DCA
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
12-DCA

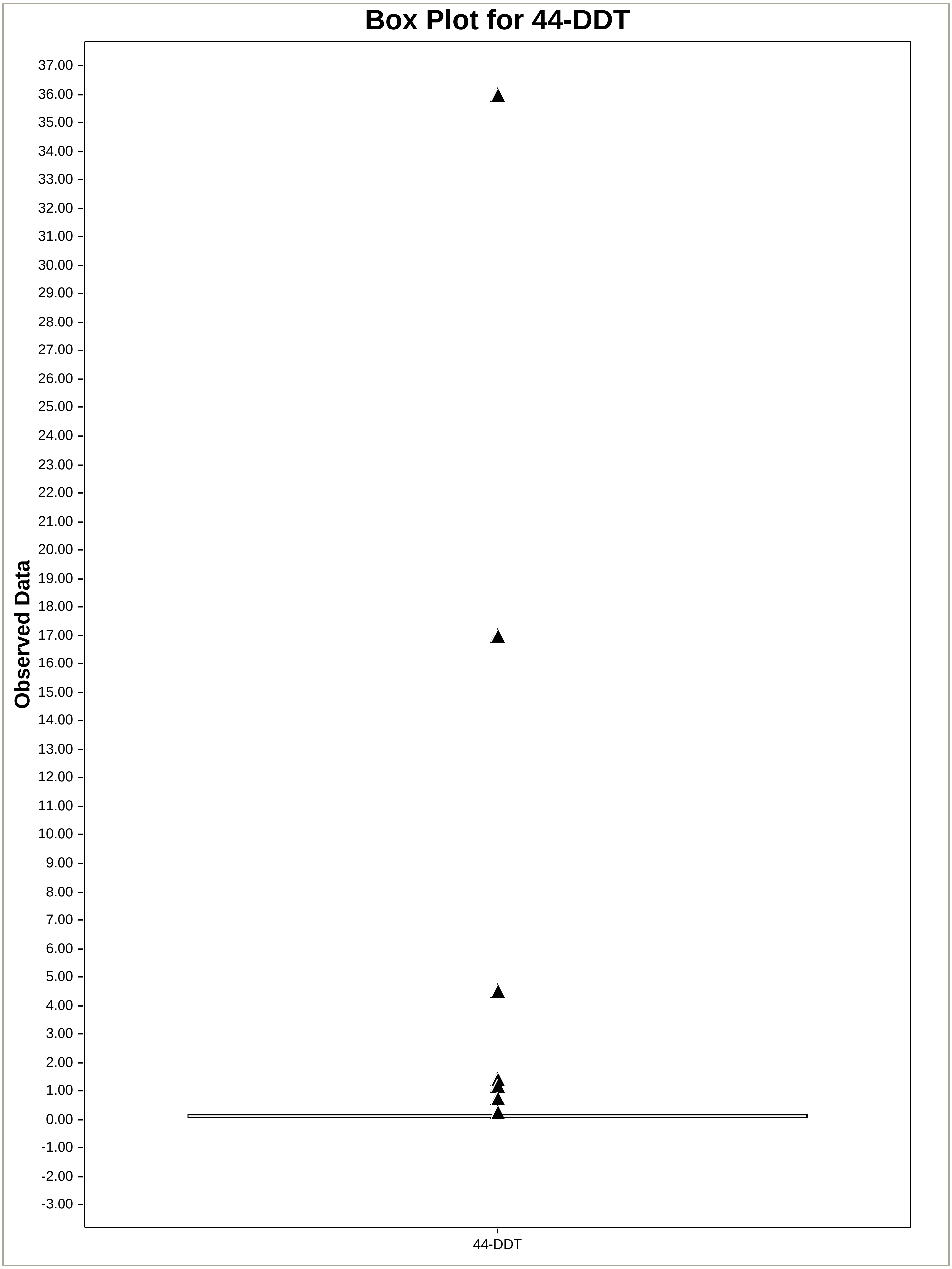

Box Plot for 13-DCB
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
13-DCB


Box Plot for 14-DCB
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
14-DCB

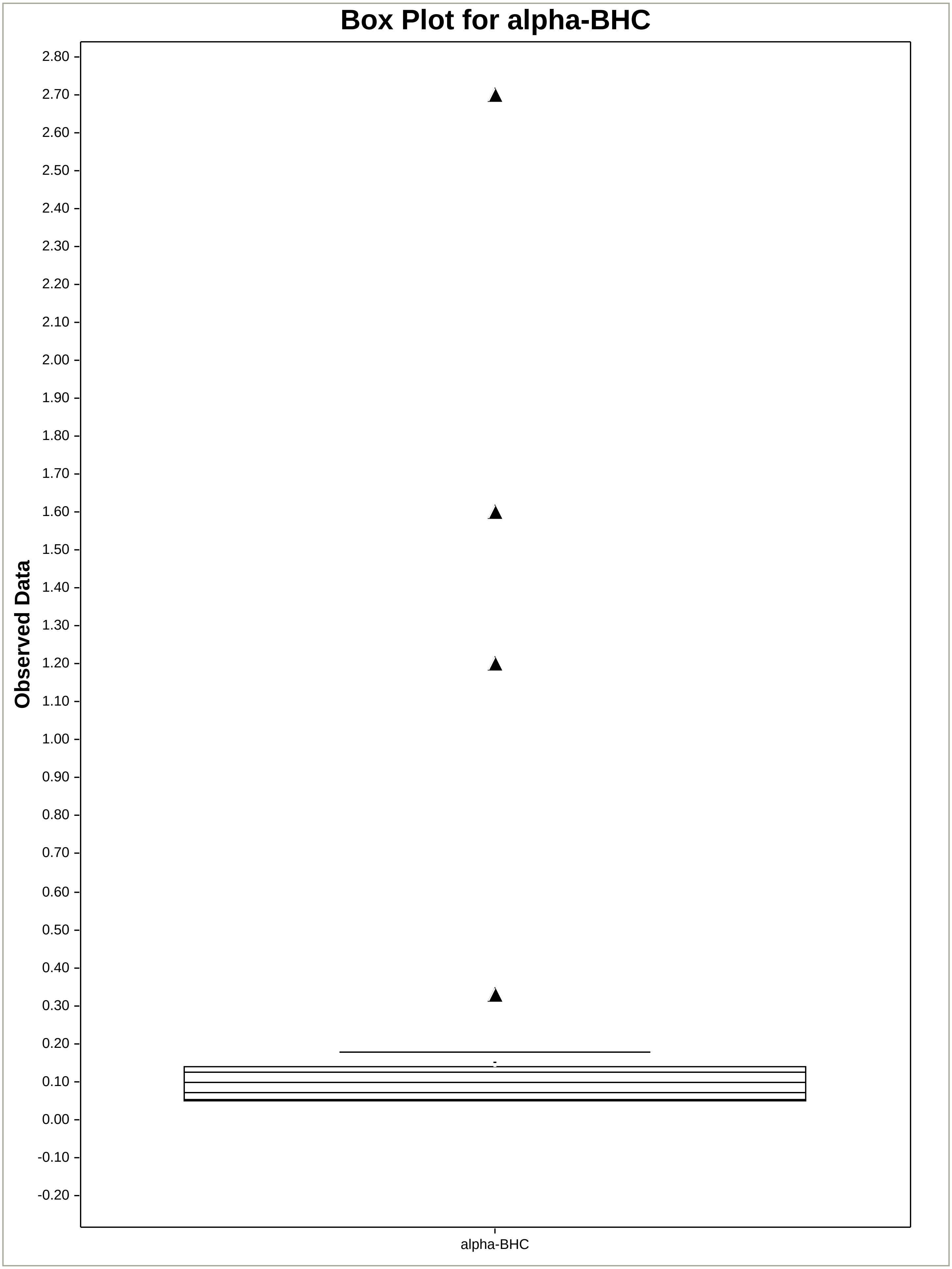


Box Plot for TCDD TEQ Shallow (pg/L)
Observed Data
56.00
54.00
52.00
50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
TCDD TEQ Shallow (pg/L)

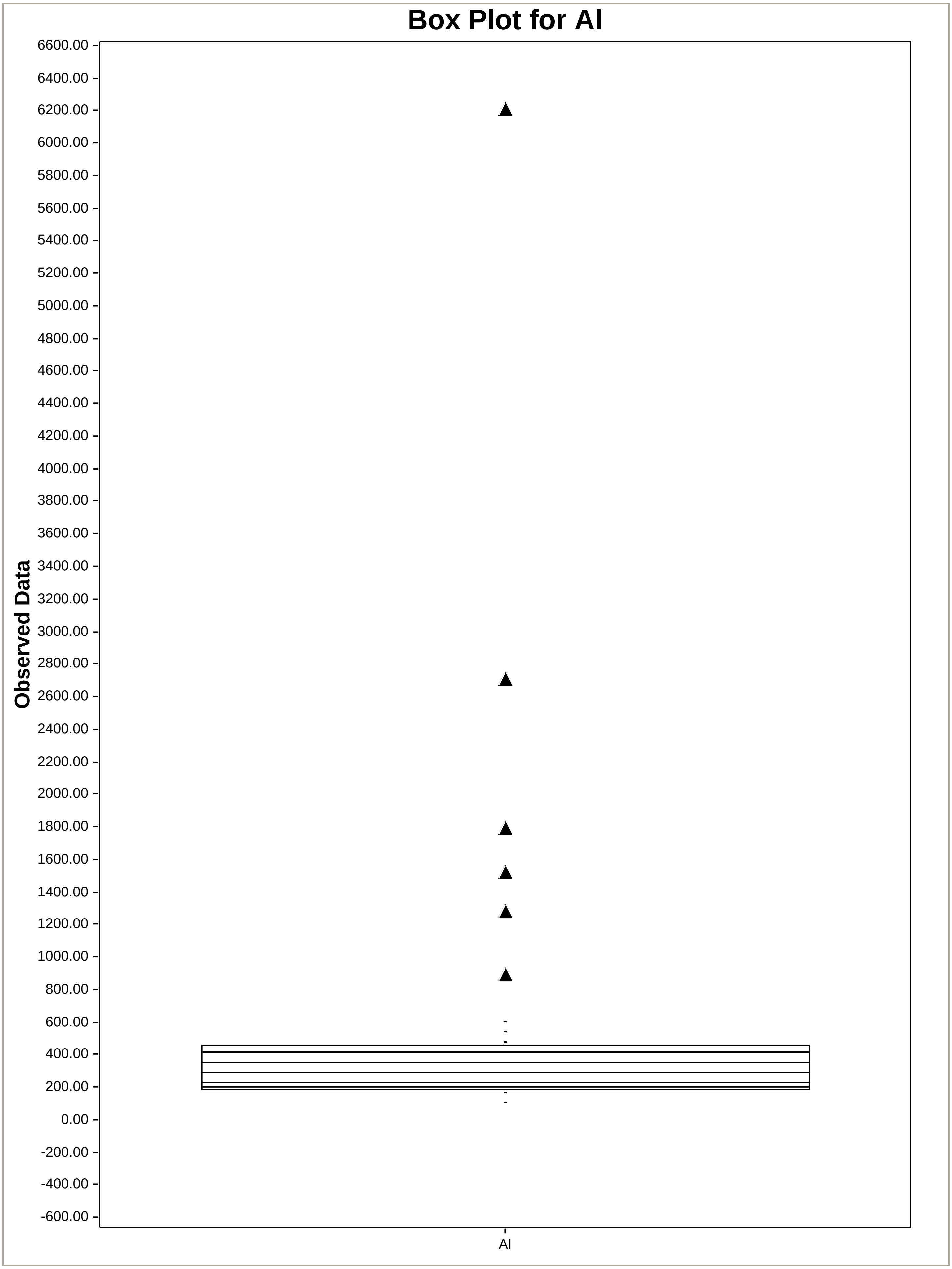

Box Plot for 44-DDD
Observed Data
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
44-DDD



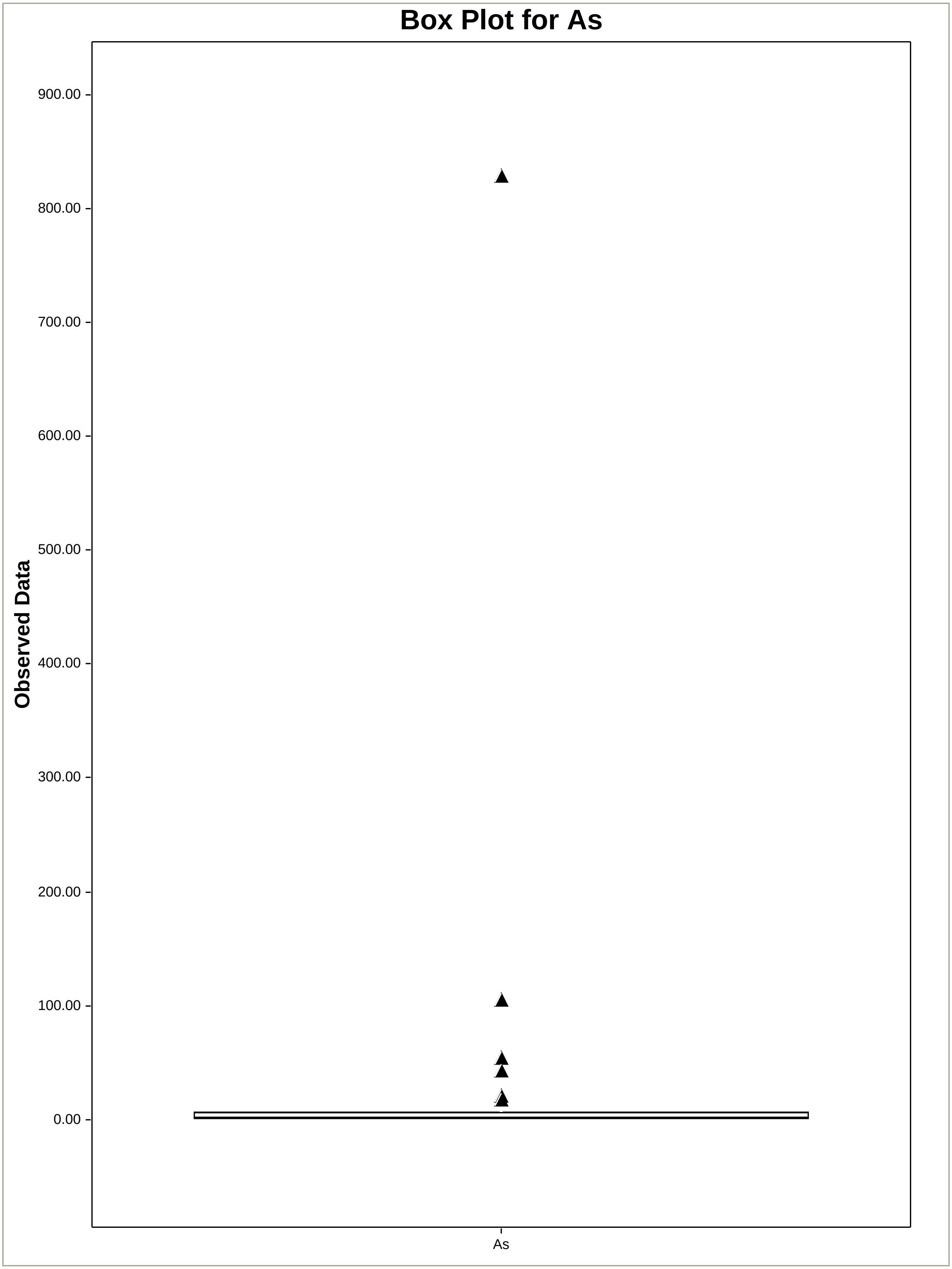
Box Plot for 44-DDT
Observed Data
37.00
36.00
35.00
34.00
33.00
32.00
31.00
30.00
29.00
28.00
27.00
26.00
25.00
24.00
23.00
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
44-DDT



Box Plot for alpha-BHC
Observed Data
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
alpha-BHC

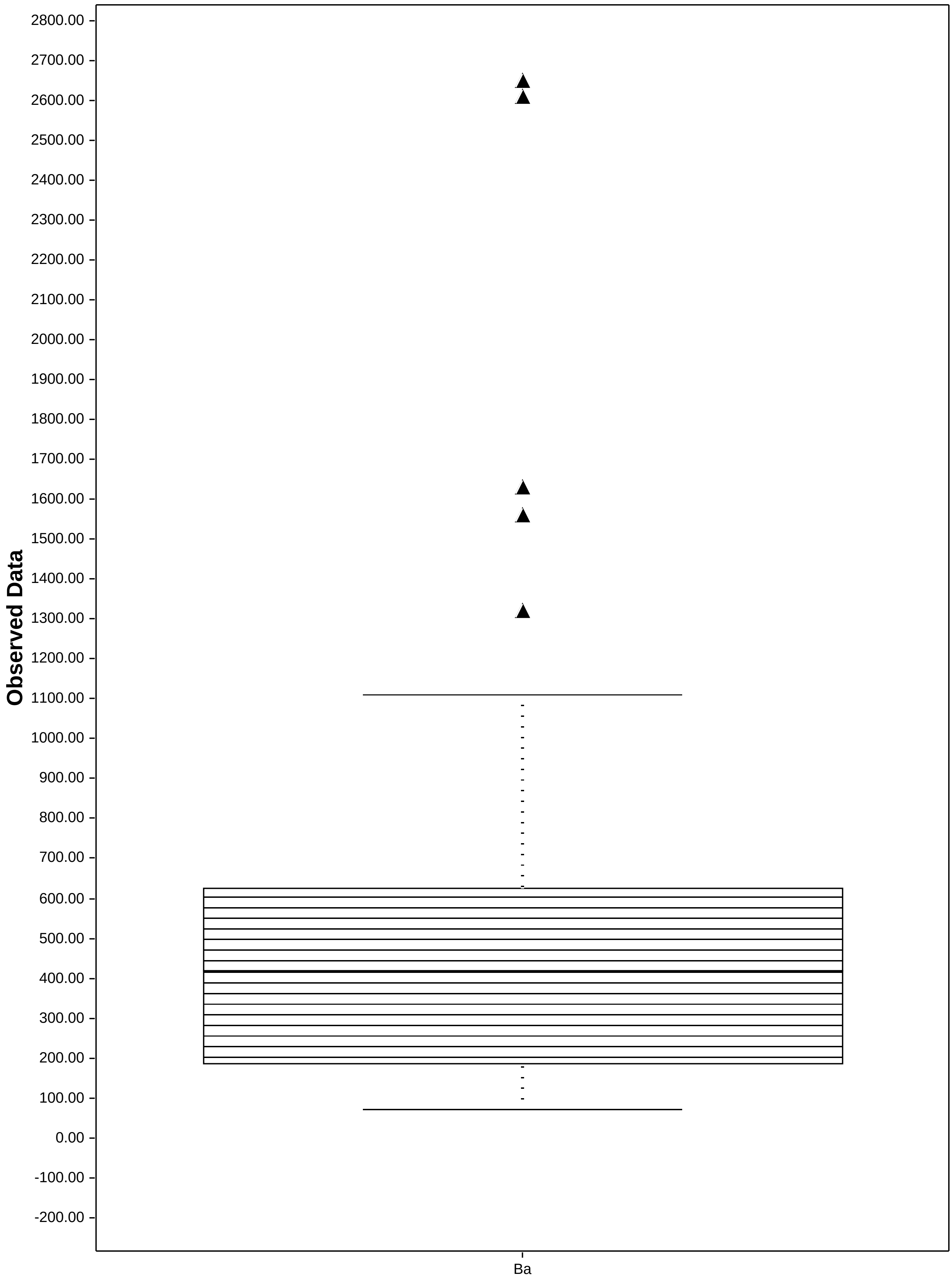


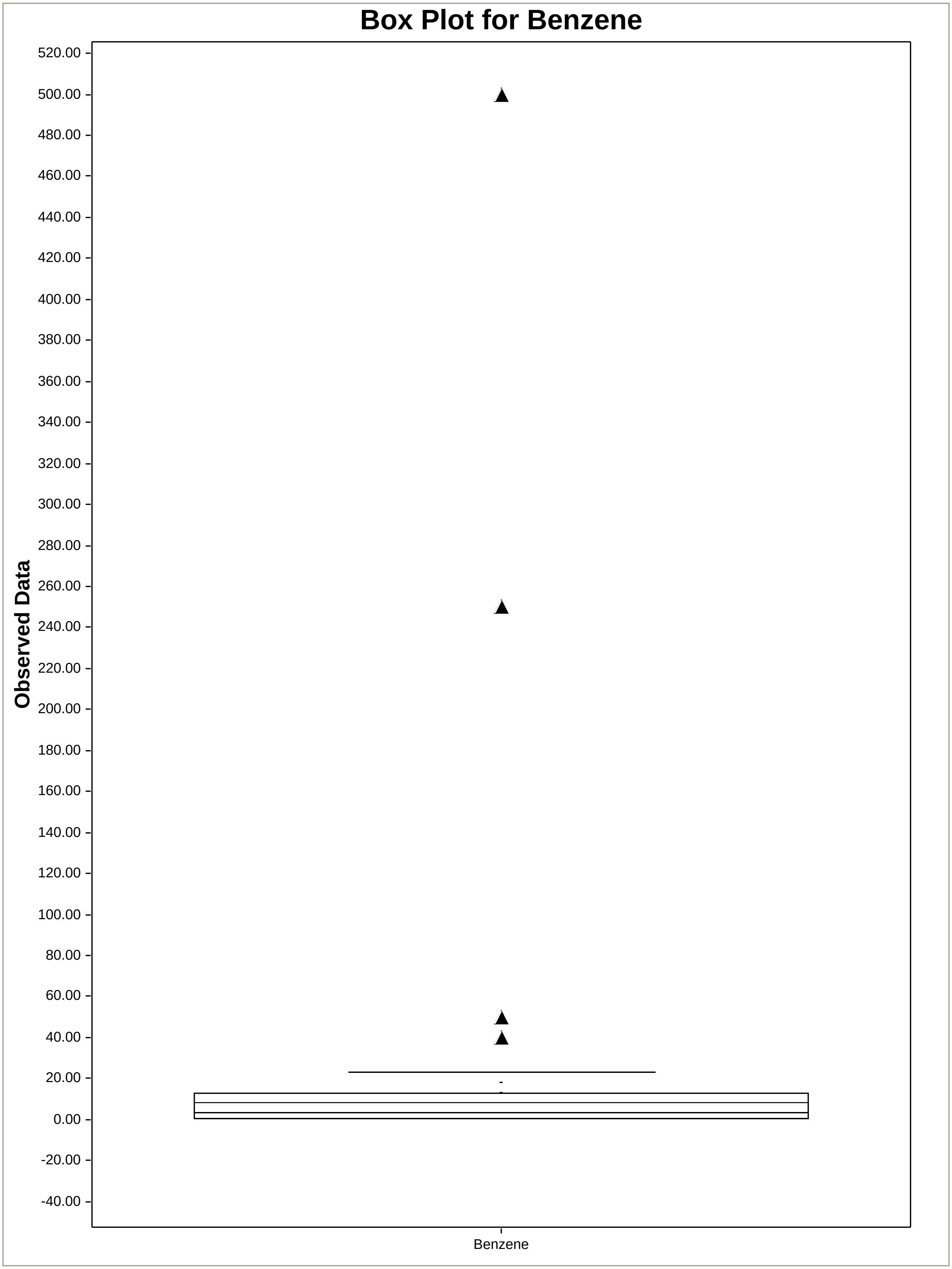
Box Plot for Al
Observed Data
6600.00
6400.00
6200.00
6000.00
5800.00
5600.00
5400.00
5200.00
5000.00
4800.00
4600.00
4400.00
4200.00
4000.00
3800.00
3600.00
3400.00
3200.00
3000.00
2800.00
2600.00
2400.00
2200.00
2000.00
1800.00
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
-200.00
-400.00
-600.00
Al



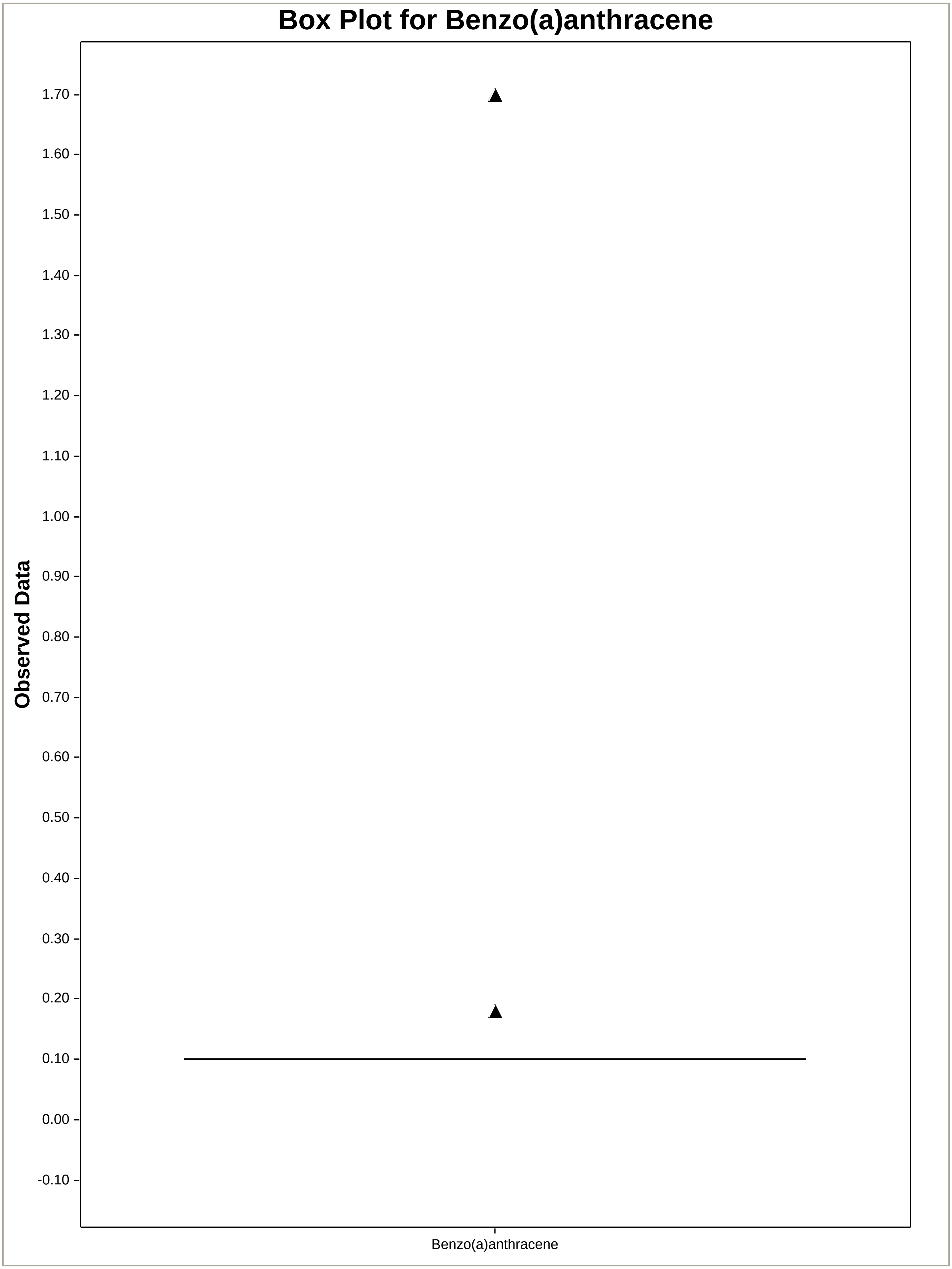
Box Plot for As
Observed Data
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
As

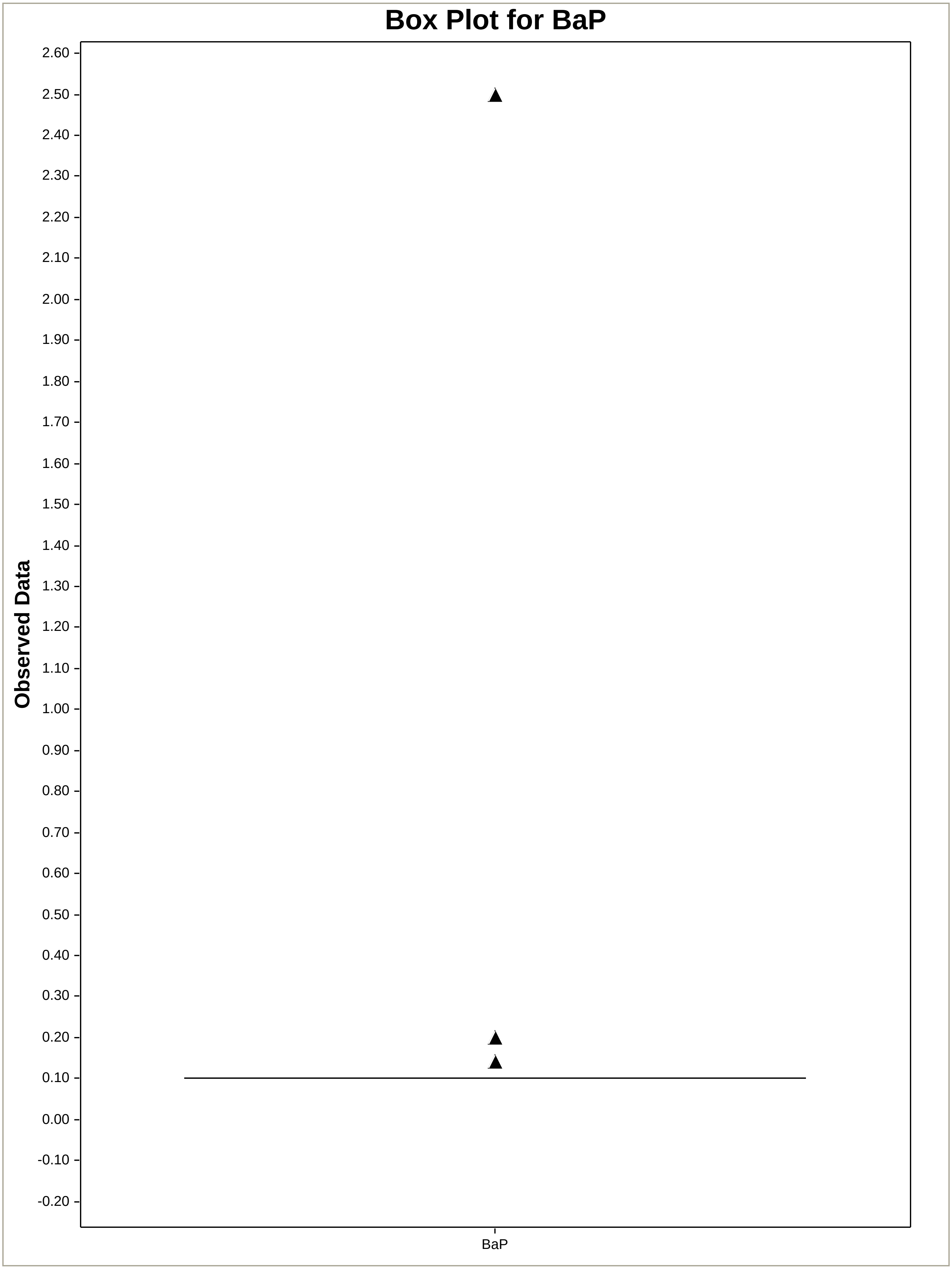
Box Plot for Ba



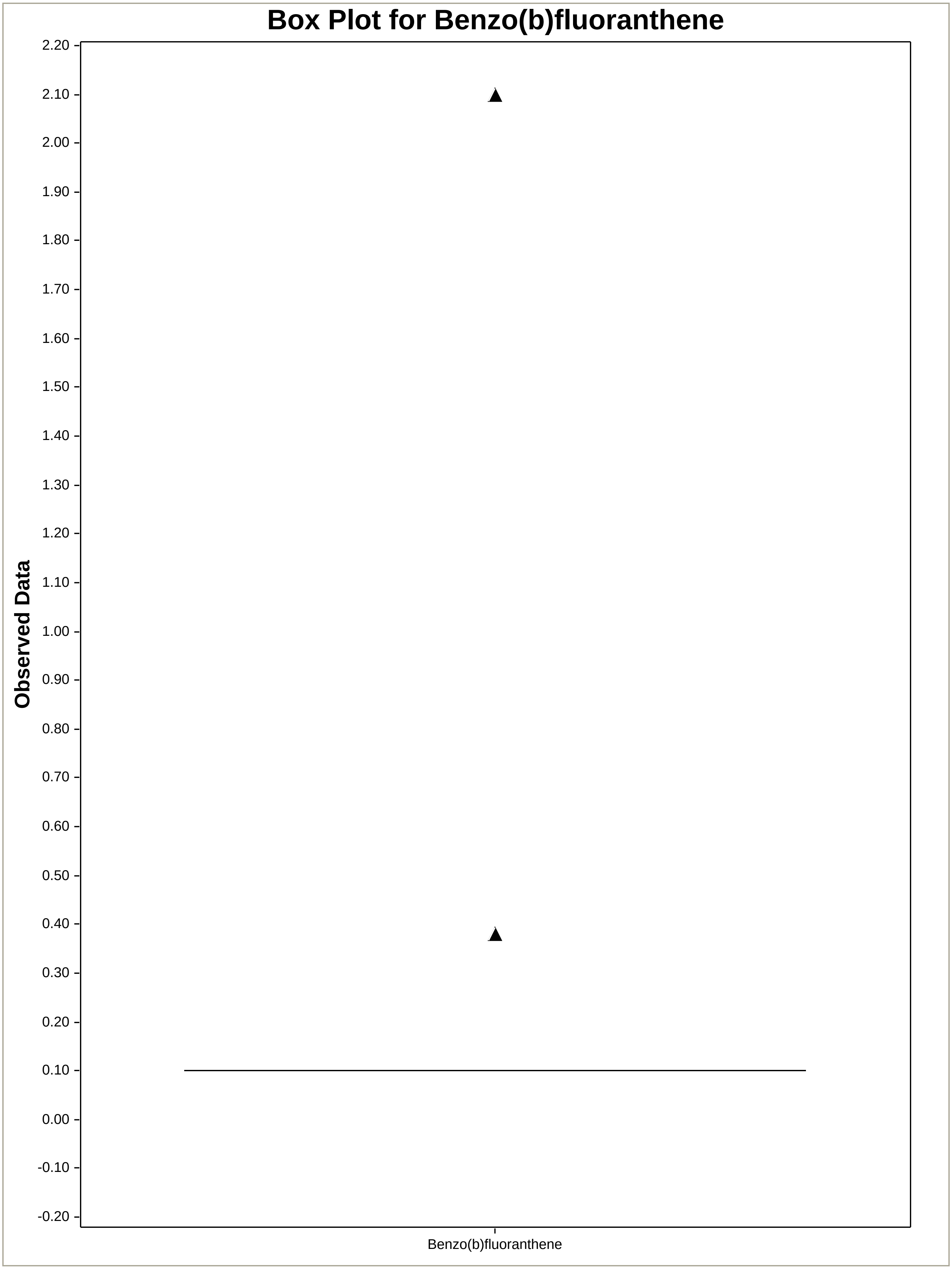


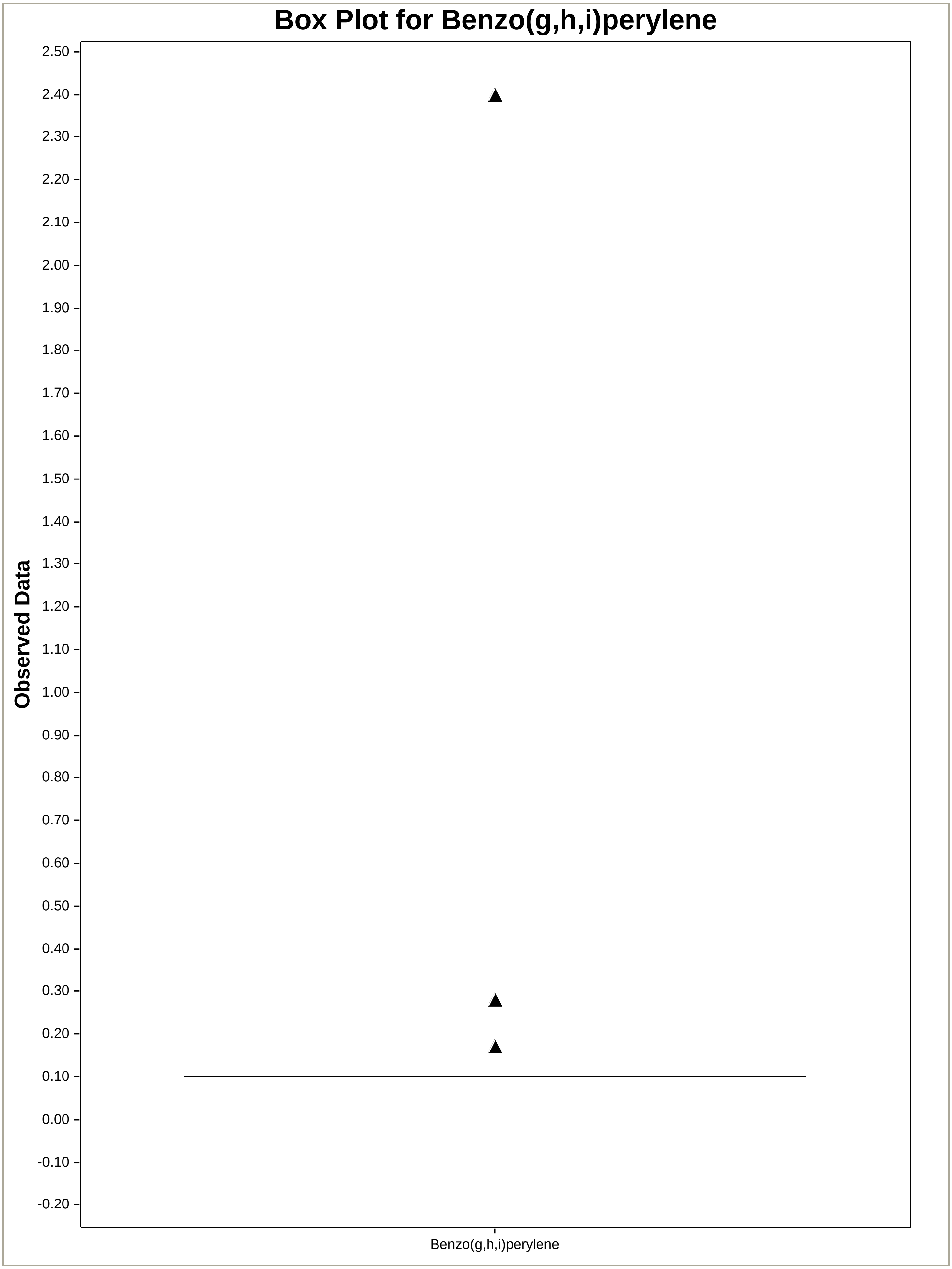
Box Plot for Benzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Benzene

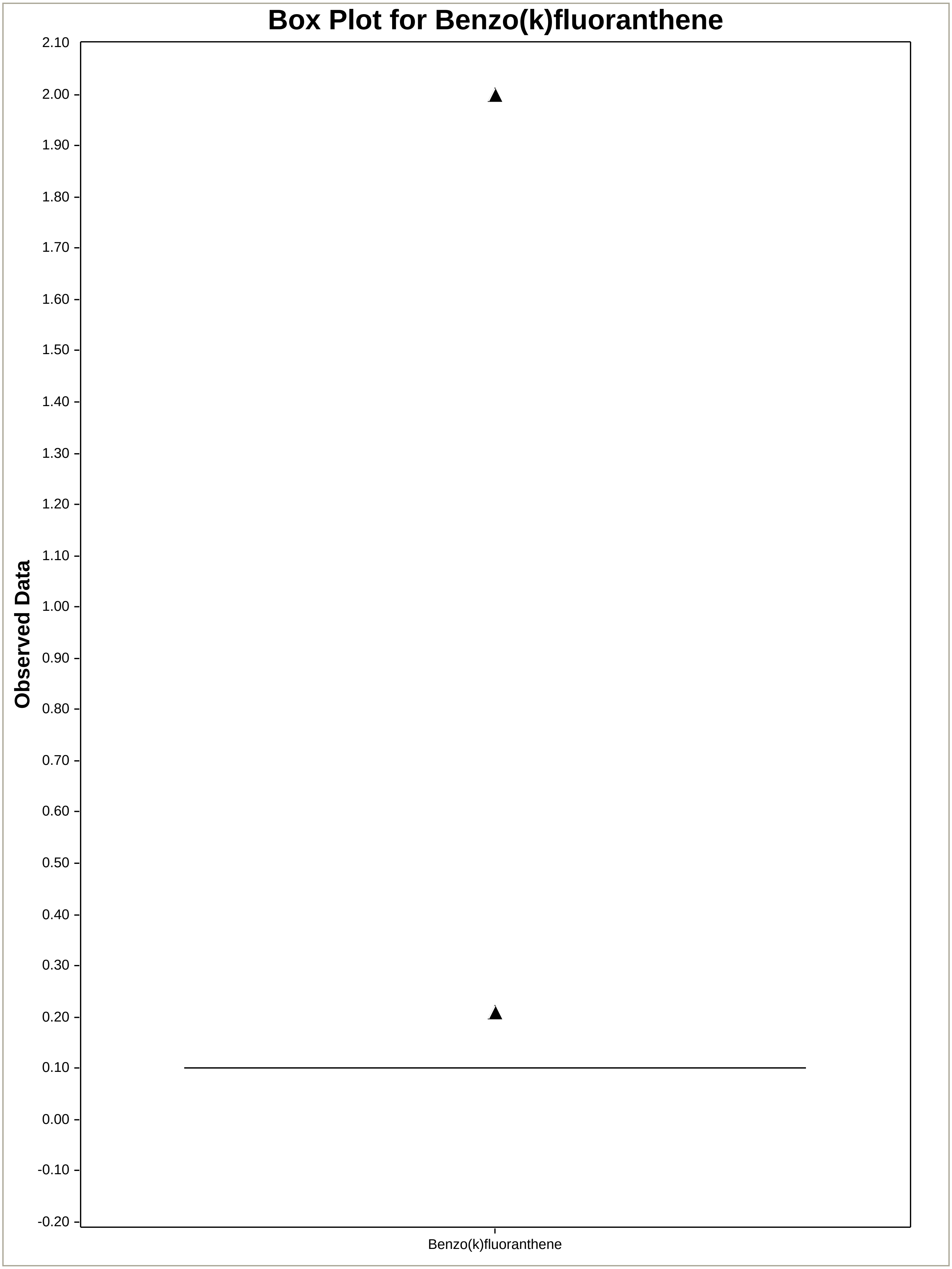

Box Plot for Benzo(a)anthracene
Observed Data
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
Benzo(a)anthracene



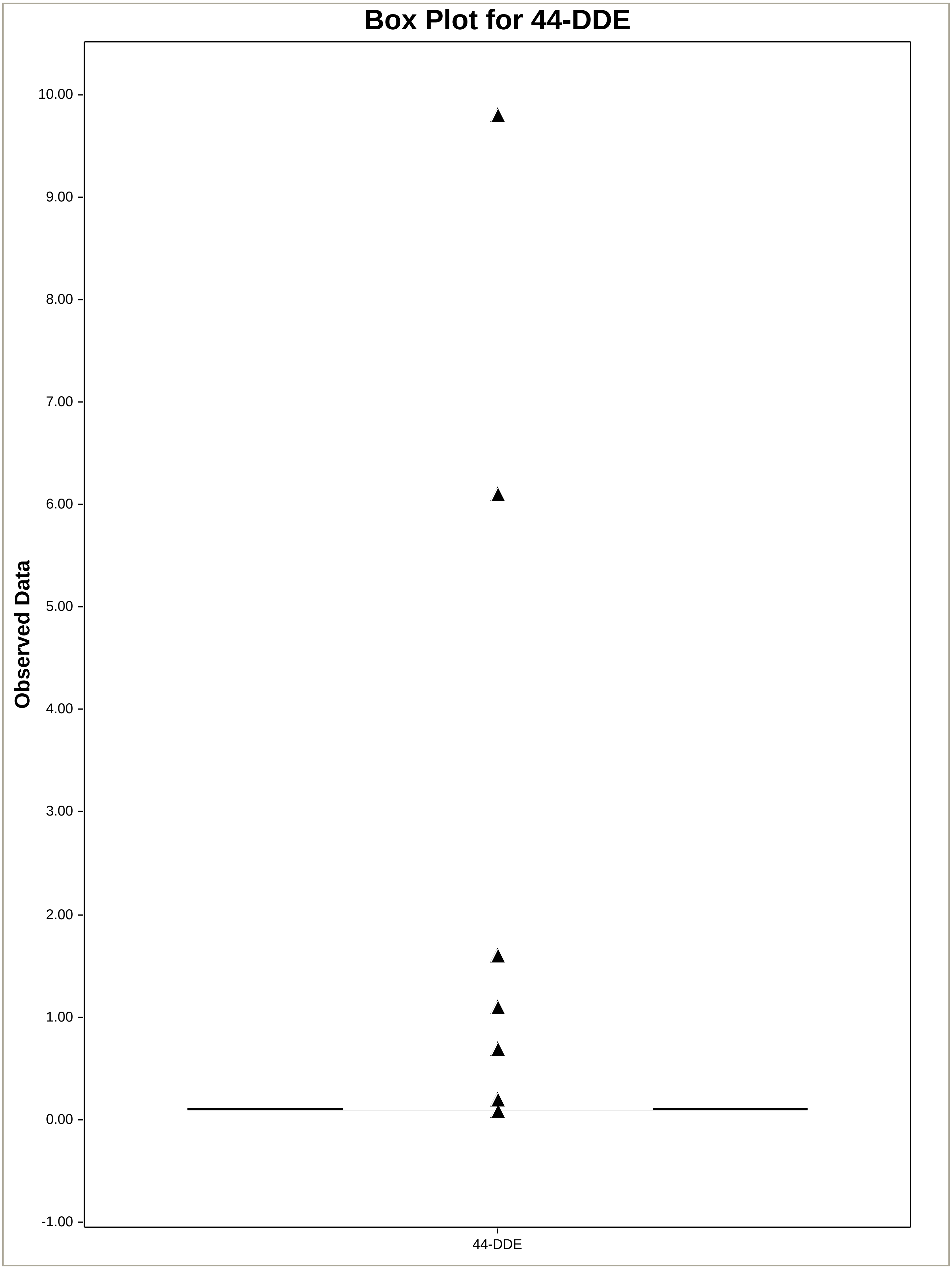
Box Plot for BaP
Observed Data
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
BaP

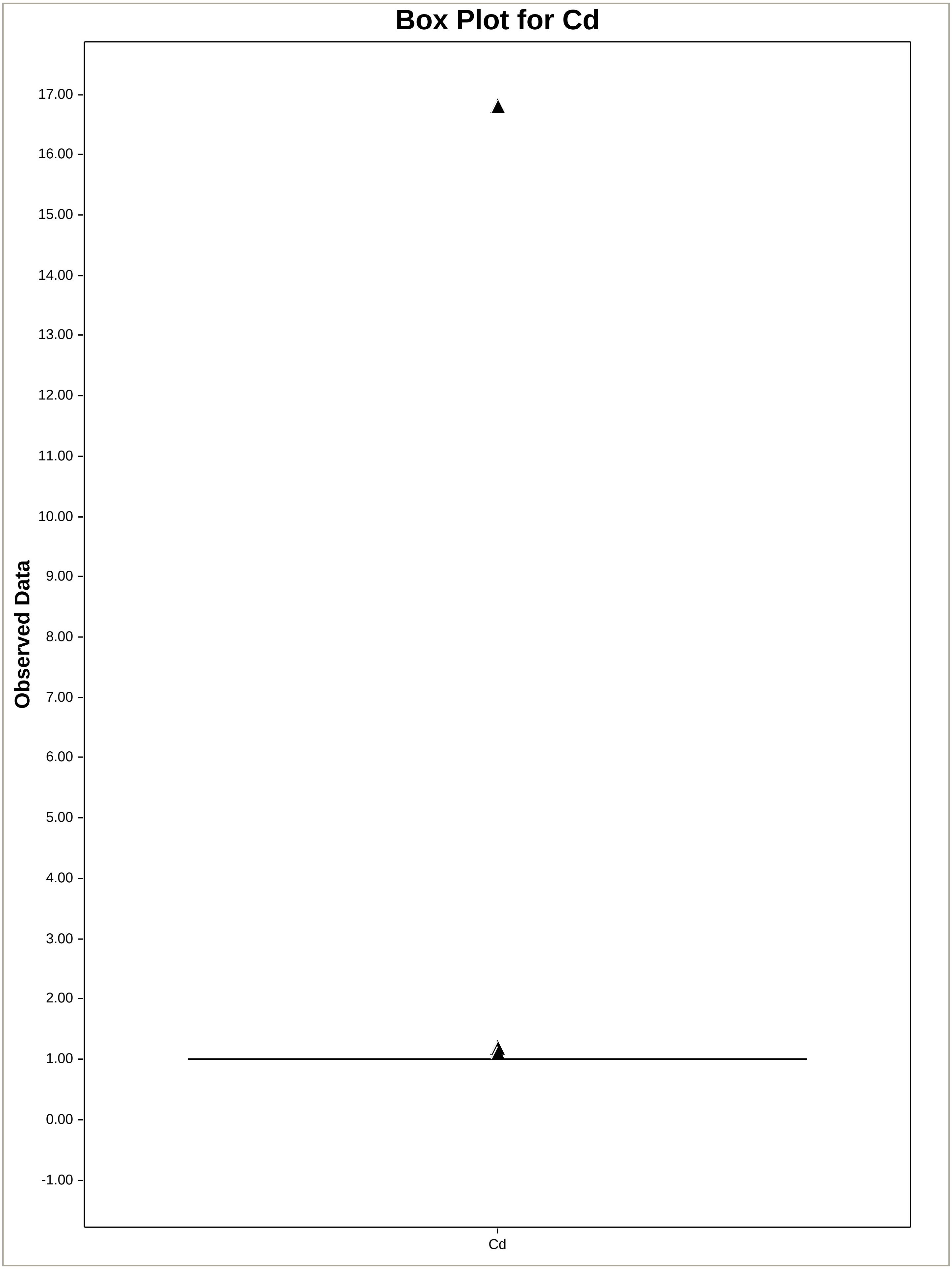

Box Plot for Benzo(b)fluoranthene
Observed Data
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Benzo(b)fluoranthene


Box Plot for Benzo(g,h,i)perylene
Observed Data
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Benzo(g,h,i)perylene



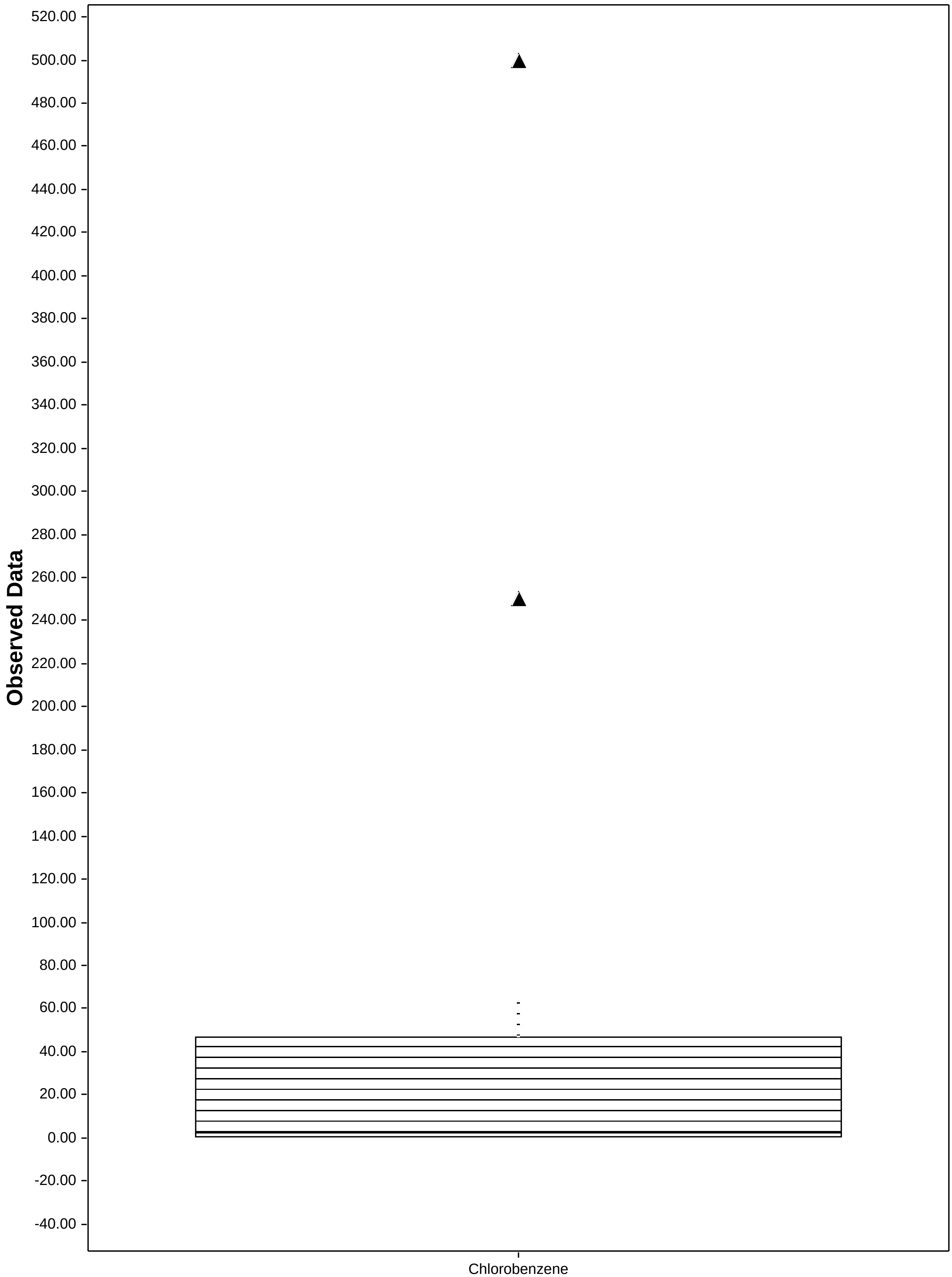
Box Plot for Benzo(k)fluoranthene
Observed Data
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Benzo(k)fluoranthene

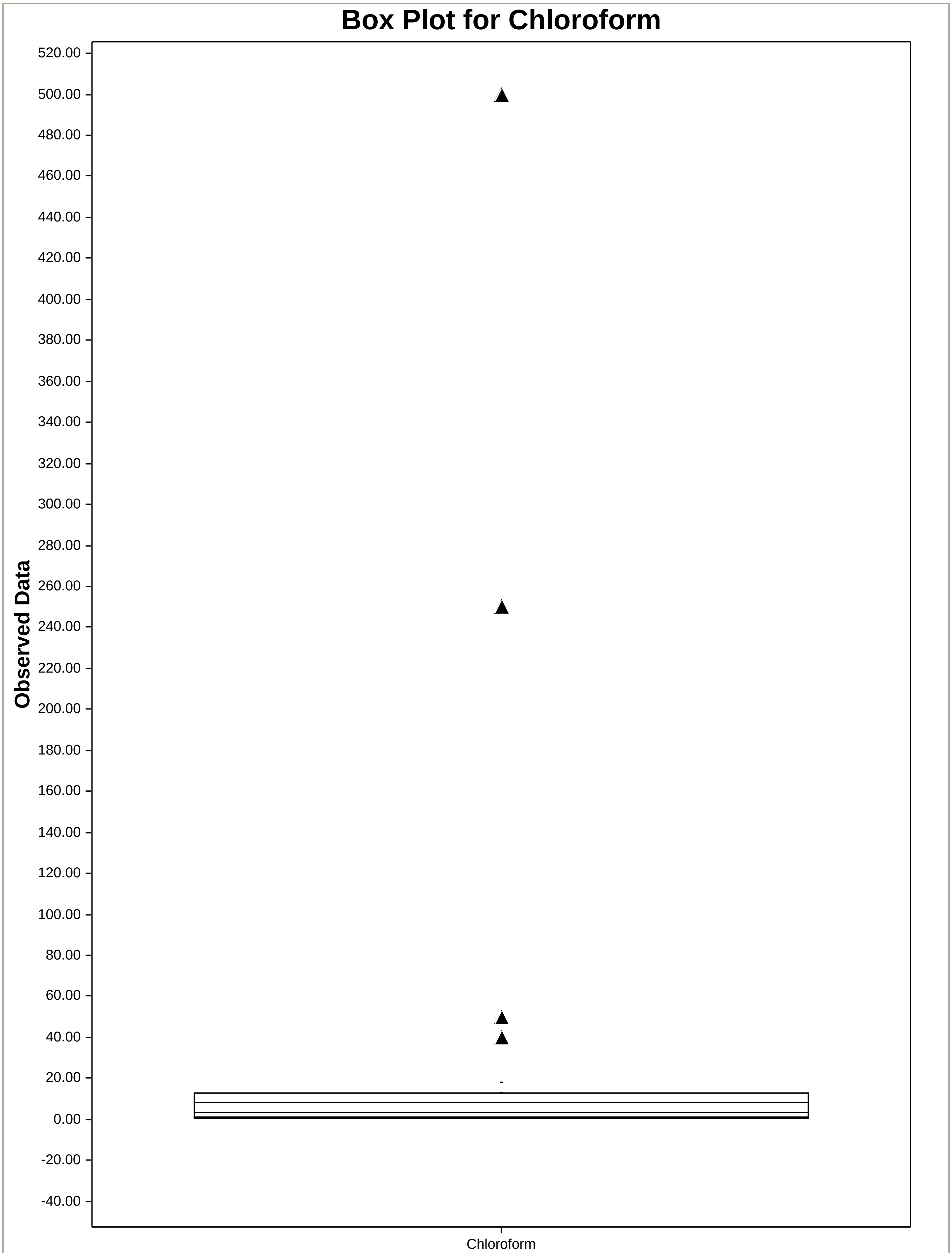

Box Plot for 44-DDE
Observed Data
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
44-DDE

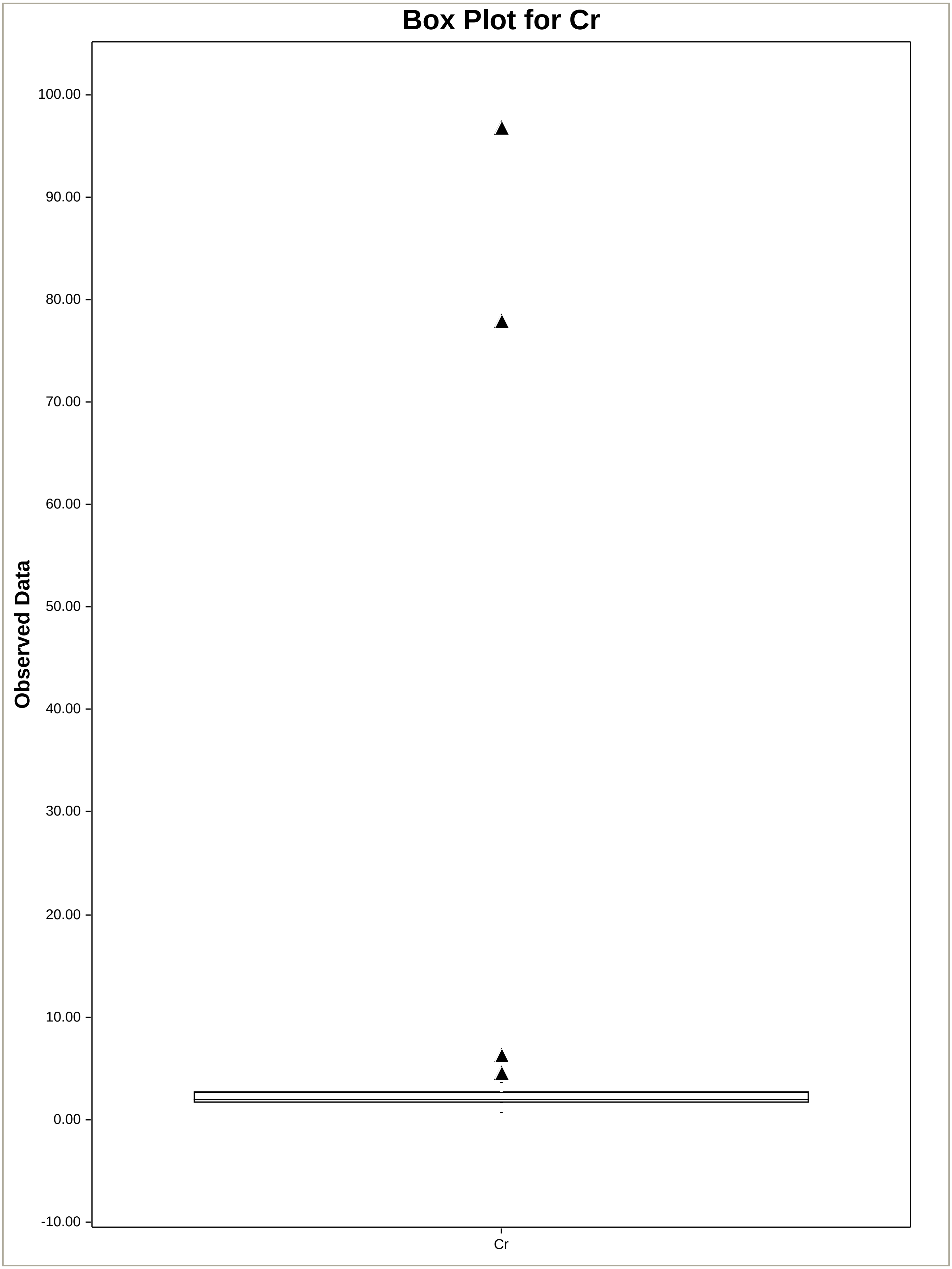


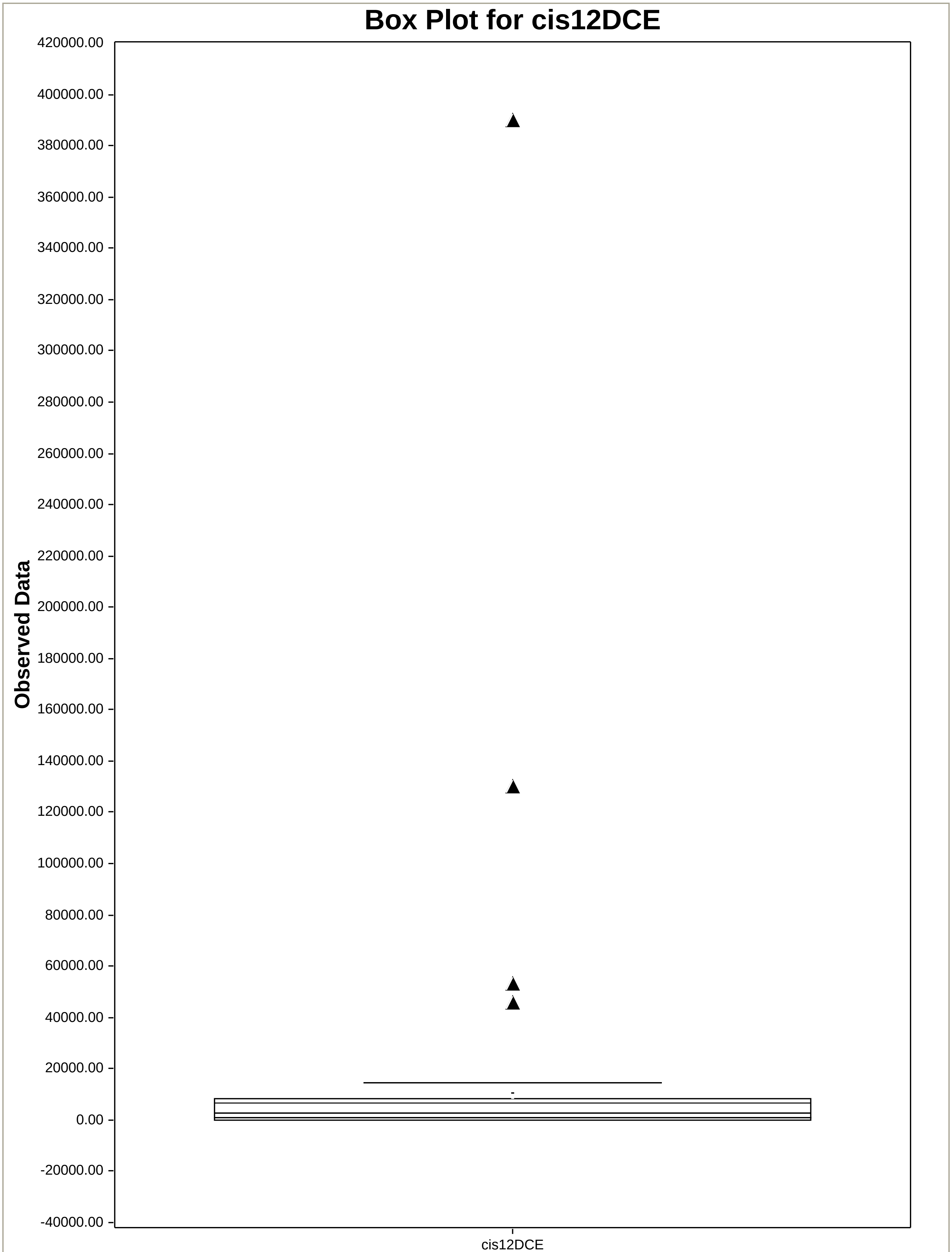
Box Plot for Cd
Observed Data
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
Cd

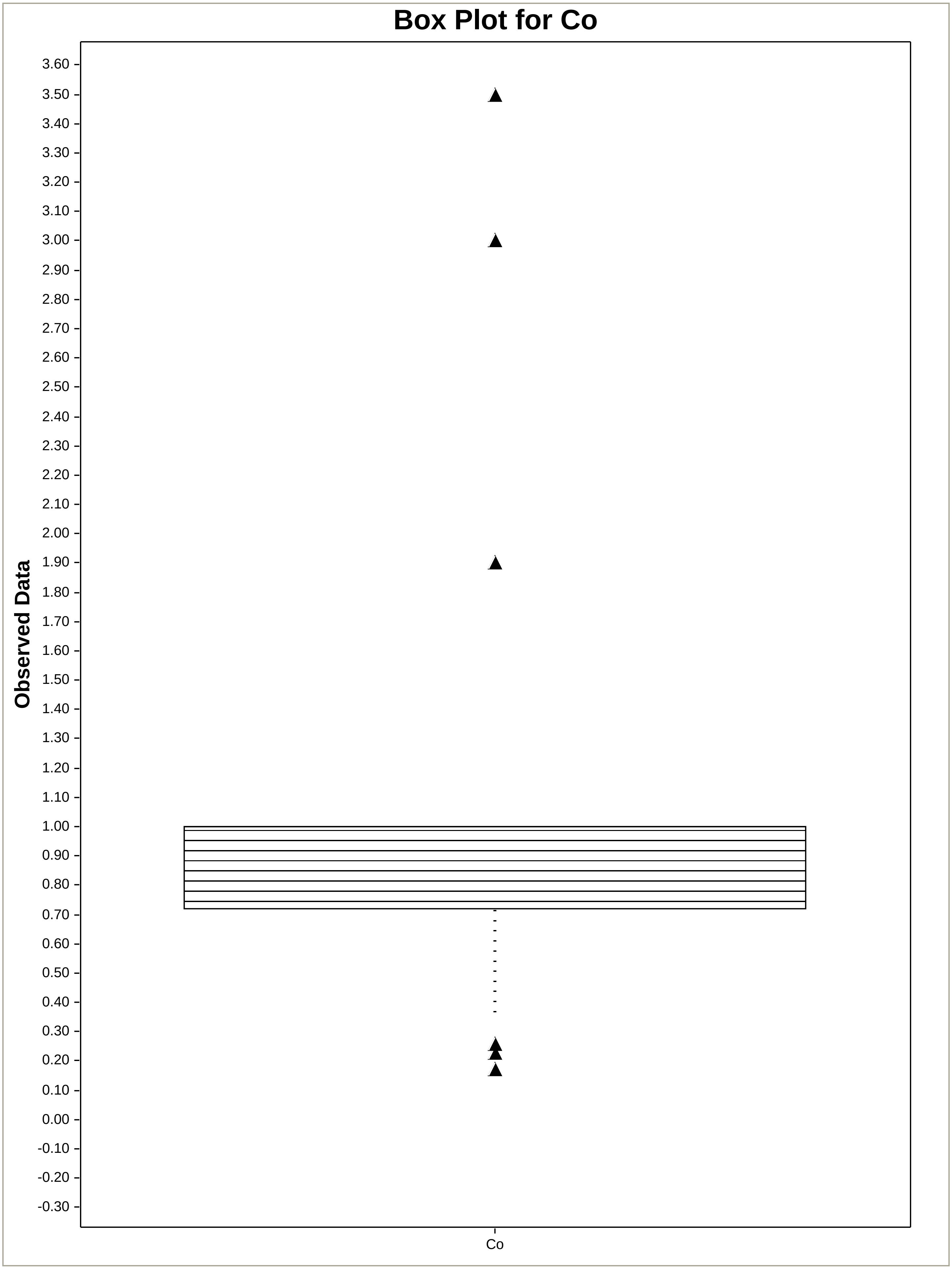
Box Plot for Chlorobenzene



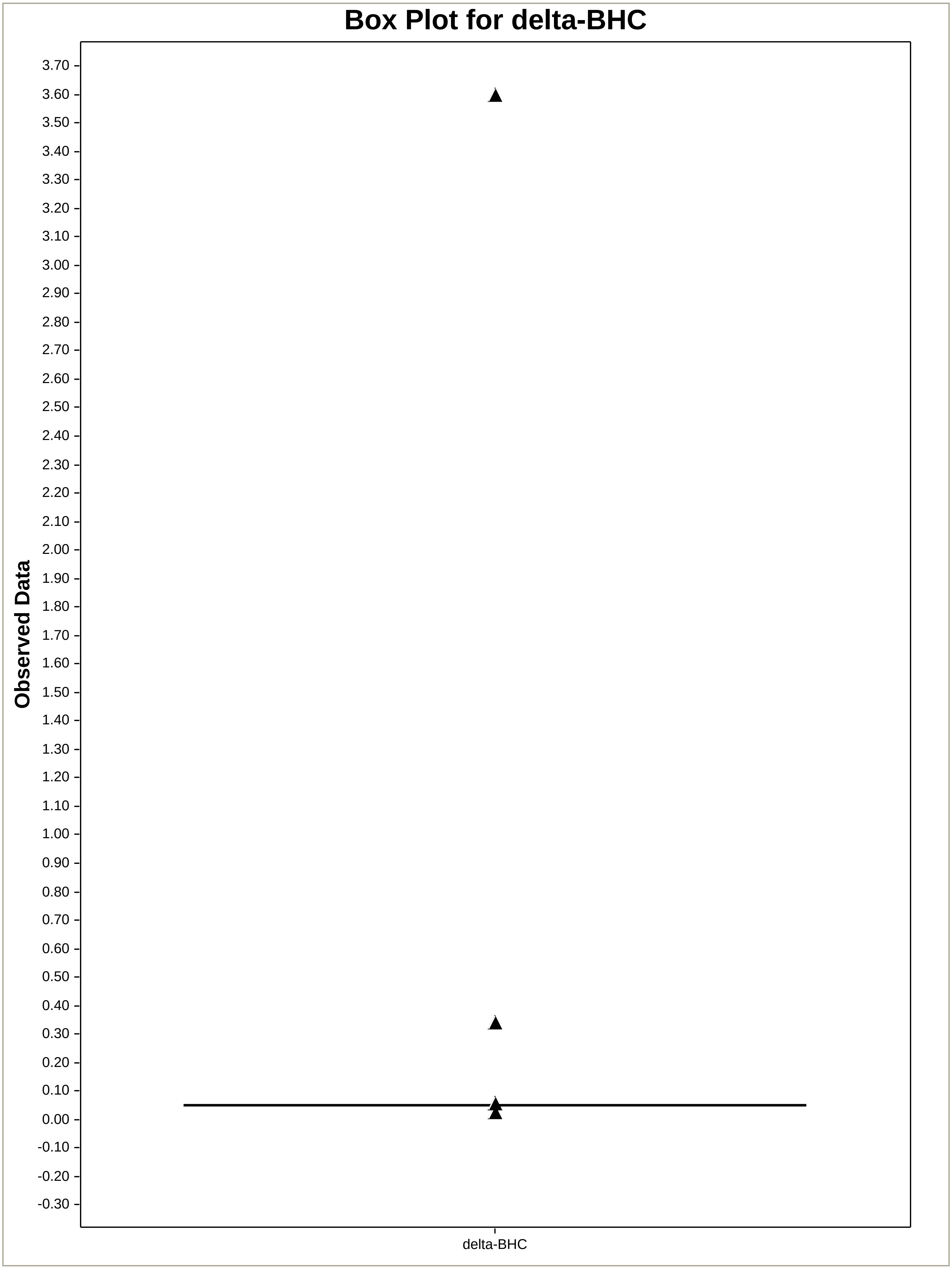

Box Plot for Chloroform
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Chloroform

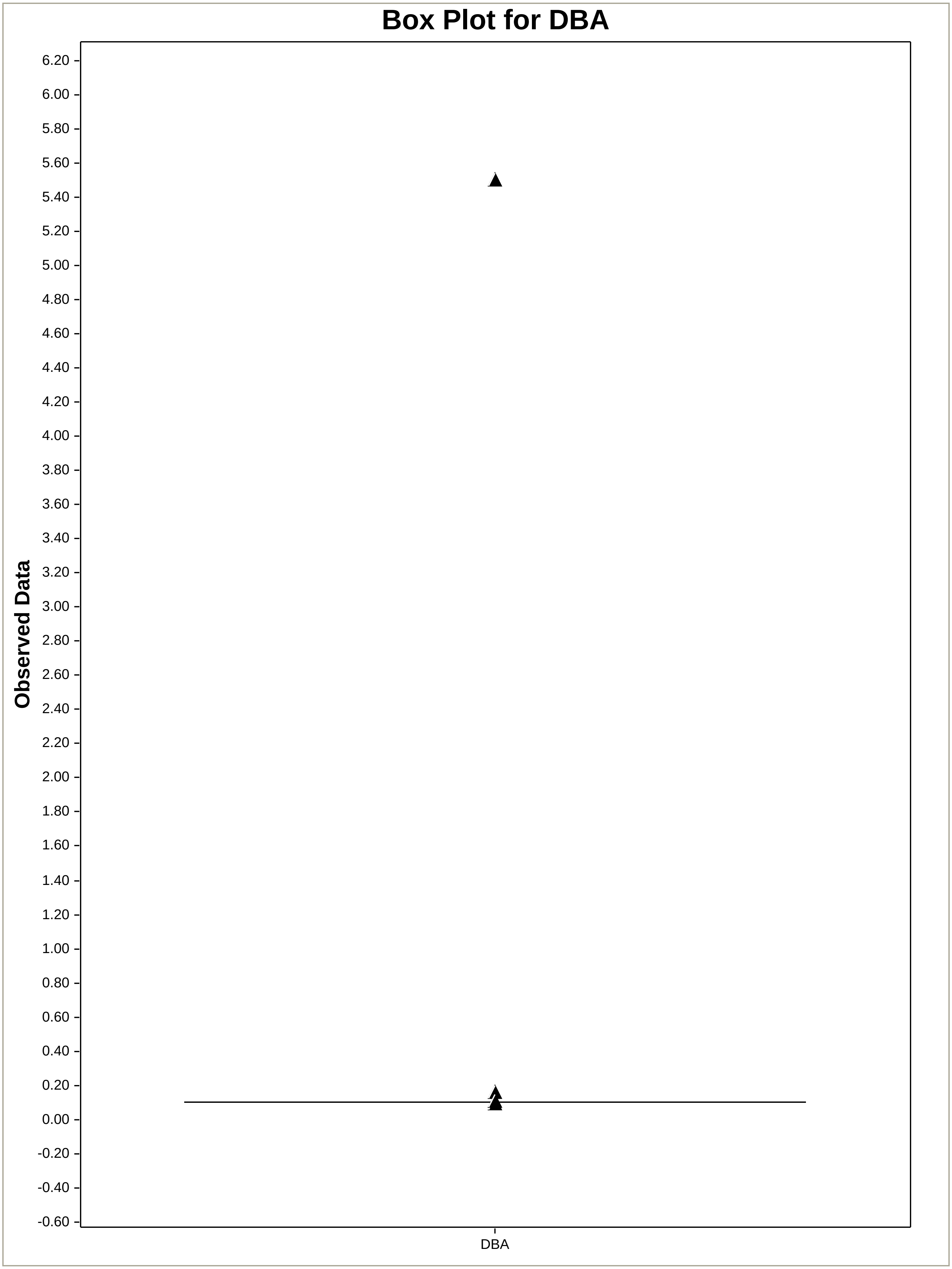

Box Plot for Cr
Observed Data
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
Cr


Box Plot for cis12DCE
Observed Data
420000.00
400000.00
380000.00
360000.00
340000.00
320000.00
300000.00
280000.00
260000.00
240000.00
220000.00
200000.00
180000.00
160000.00
140000.00
120000.00
100000.00
80000.00
60000.00
40000.00
20000.00
0.00
-20000.00
-40000.00
cis12DCE

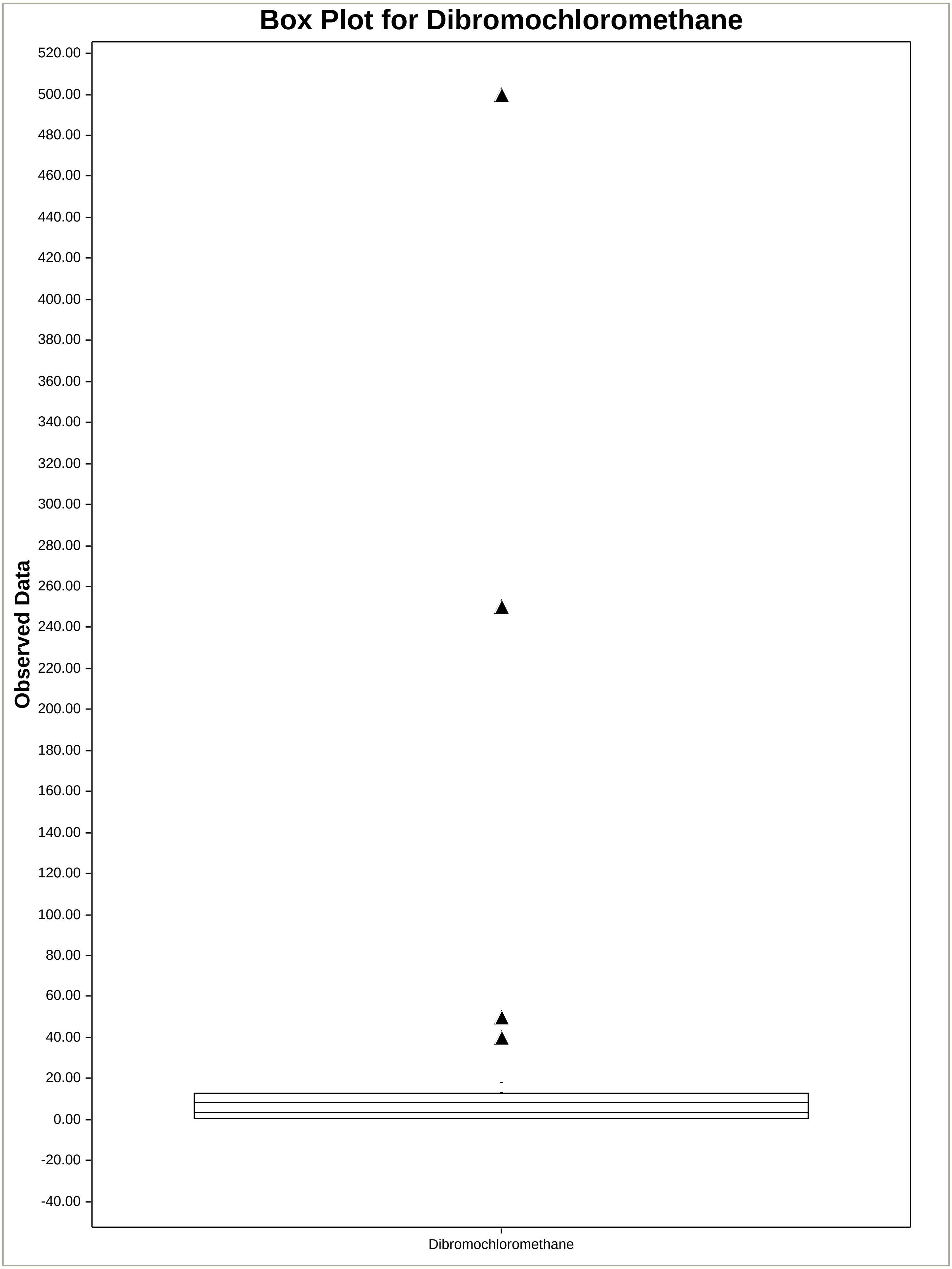


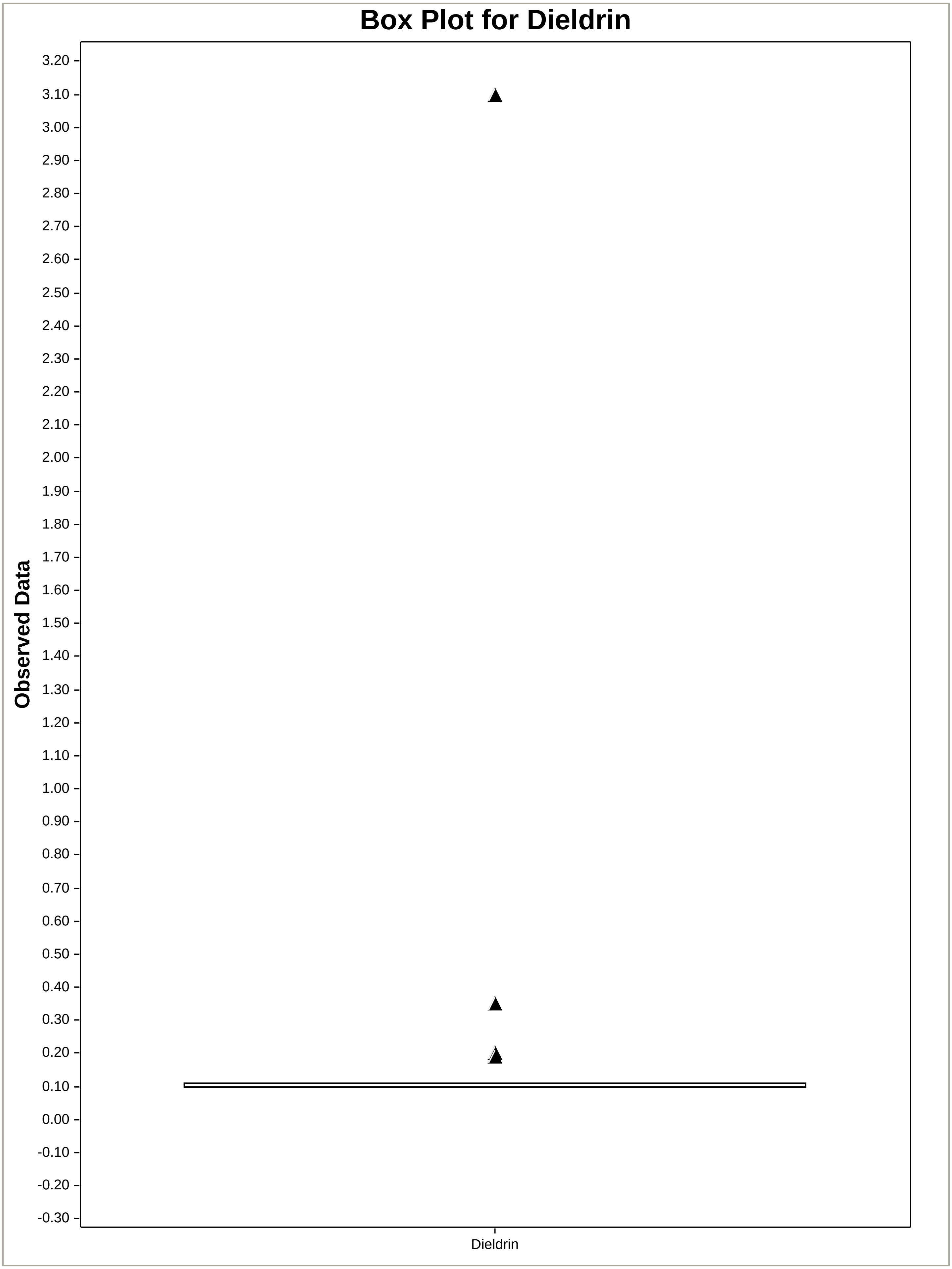
Box Plot for Co
Observed Data
3.60
3.50
3.40
3.30
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
Co

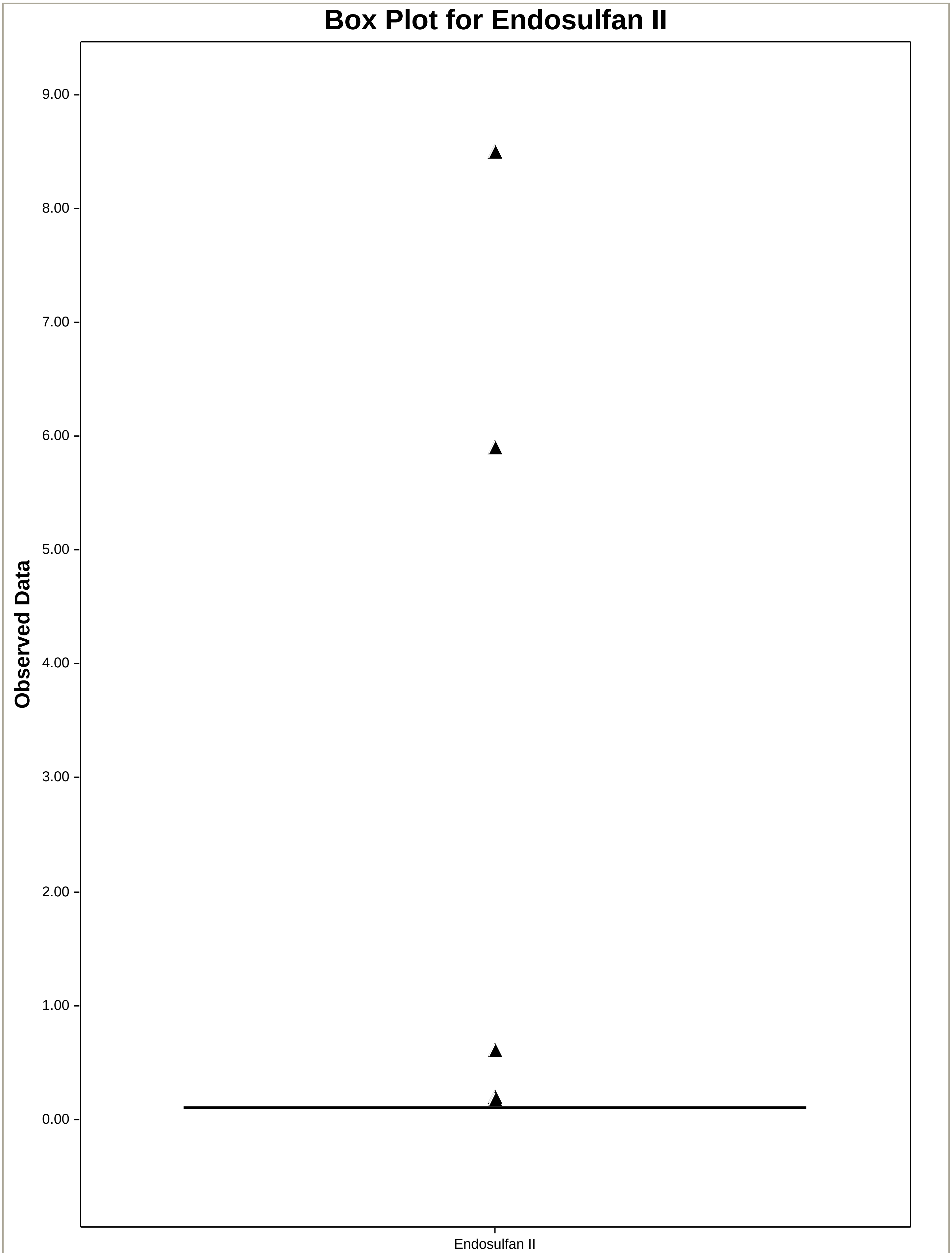

Box Plot for delta-BHC
Observed Data
3.70
3.60
3.50
3.40
3.30
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
delta-BHC

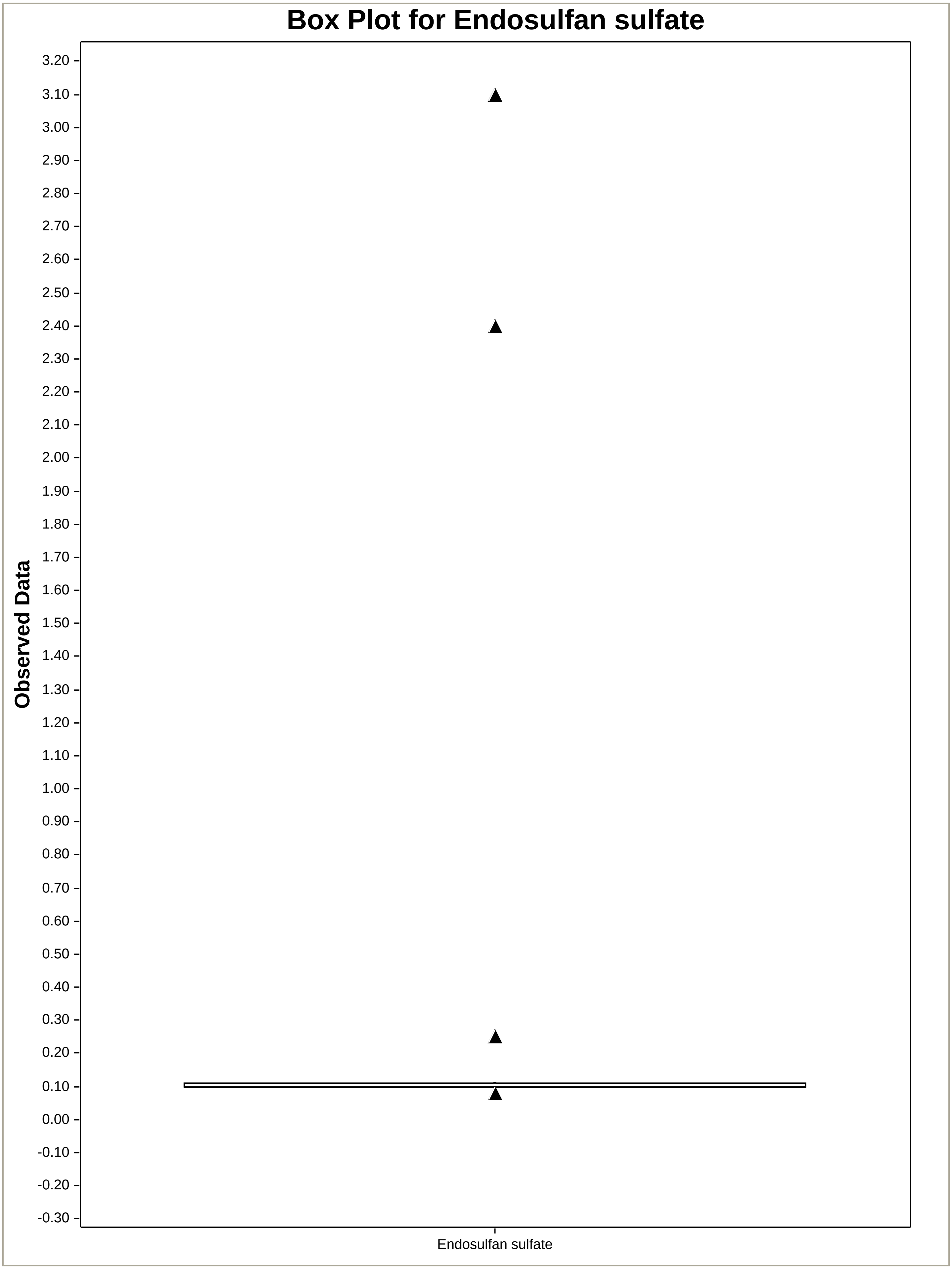


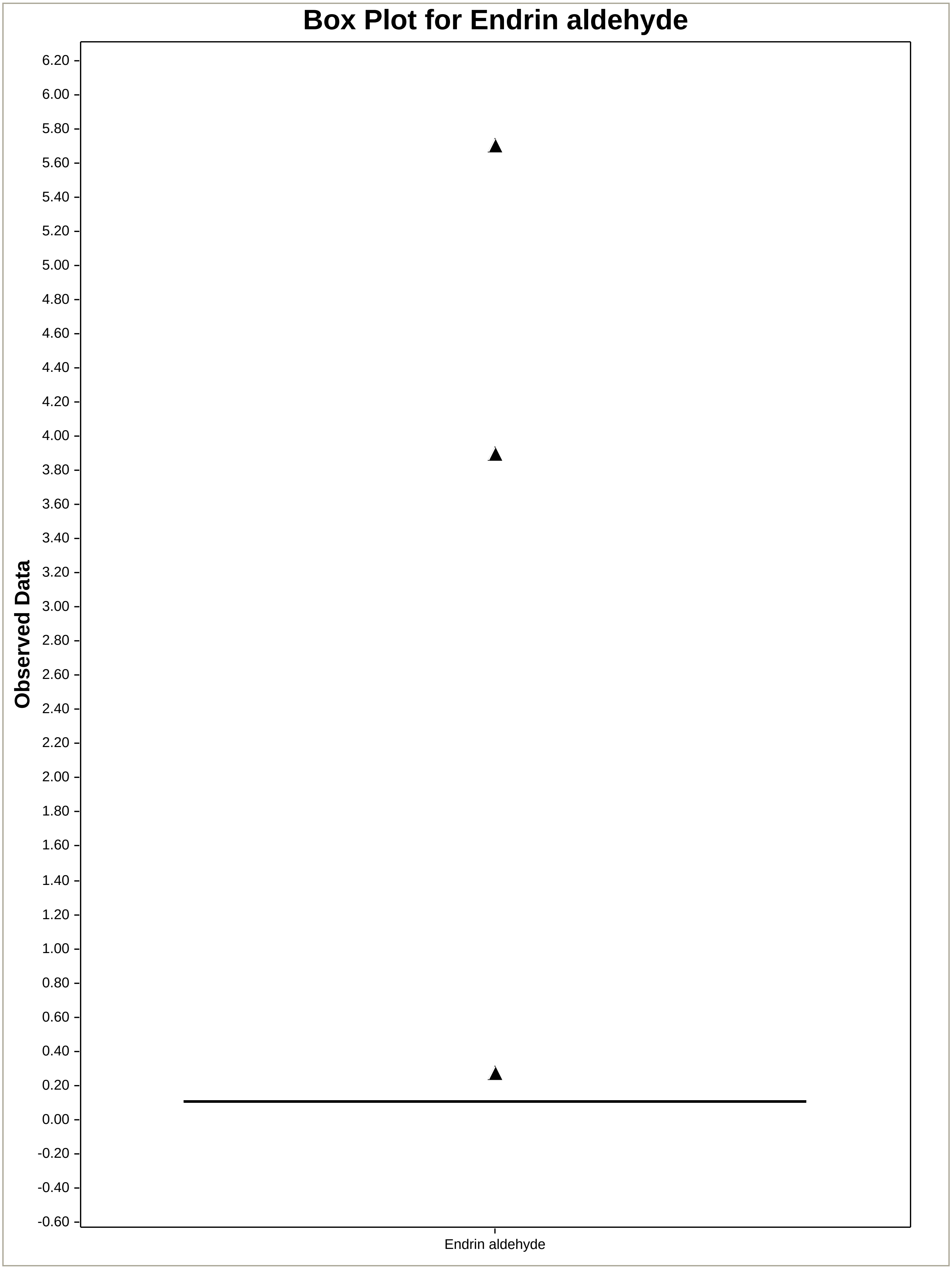
Box Plot for DBA
Observed Data
6.20
6.00
5.80
5.60
5.40
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
DBA

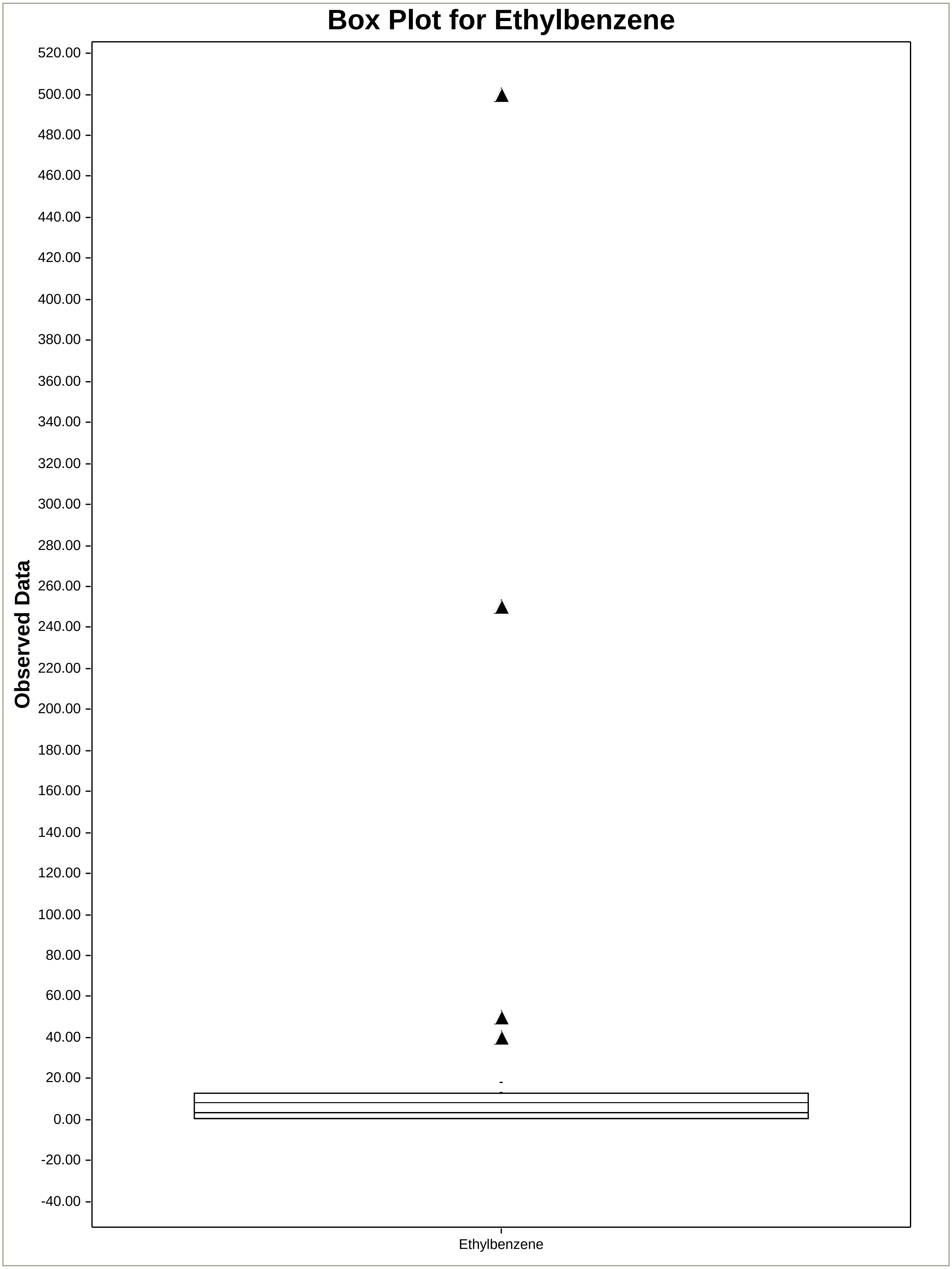

Box Plot for Dibromochloromethane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Dibromochloromethane

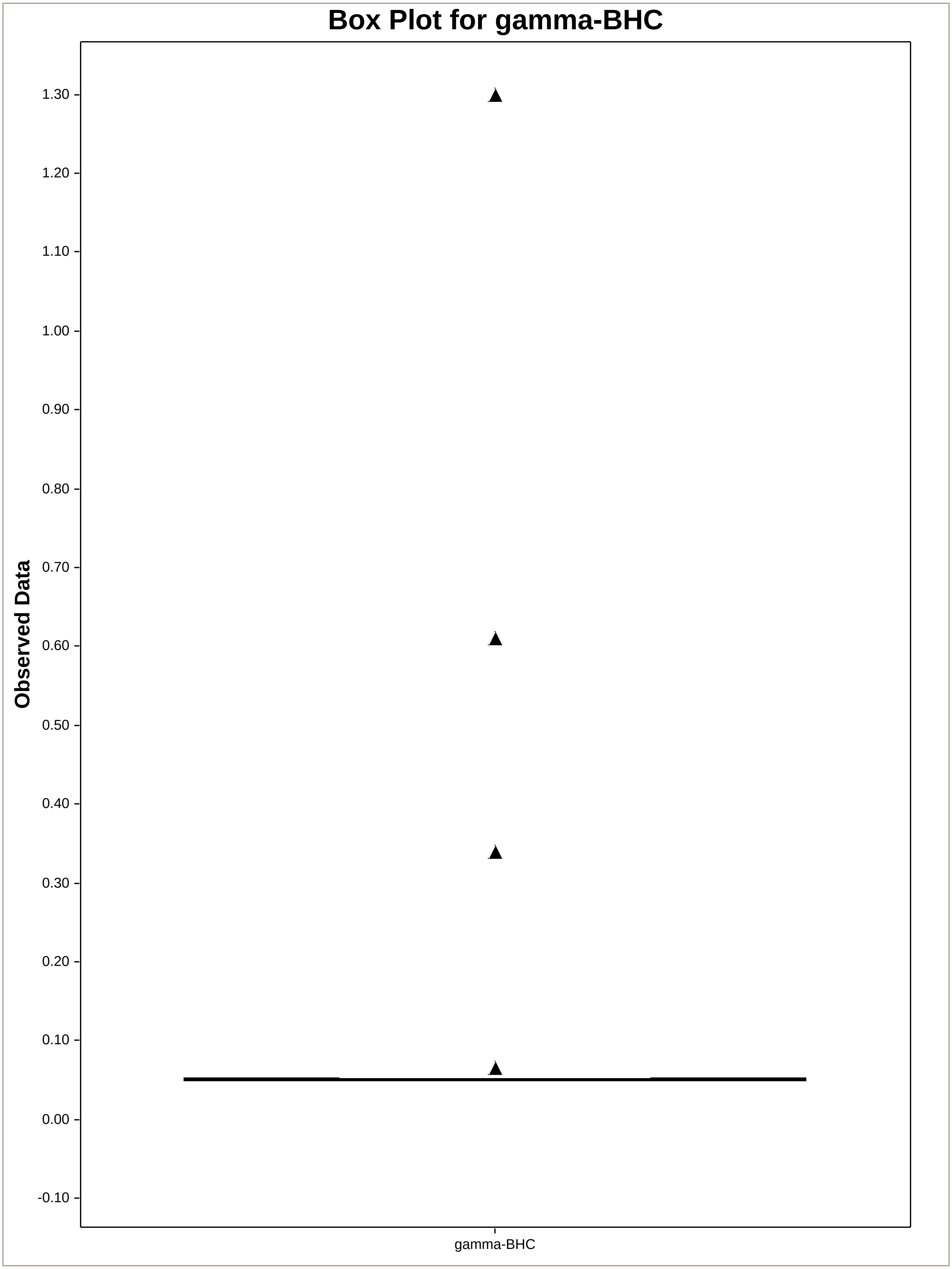

Box Plot for Dieldrin
Observed Data
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
Dieldrin


Box Plot for Endosulfan II
Observed Data
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Endosulfan II

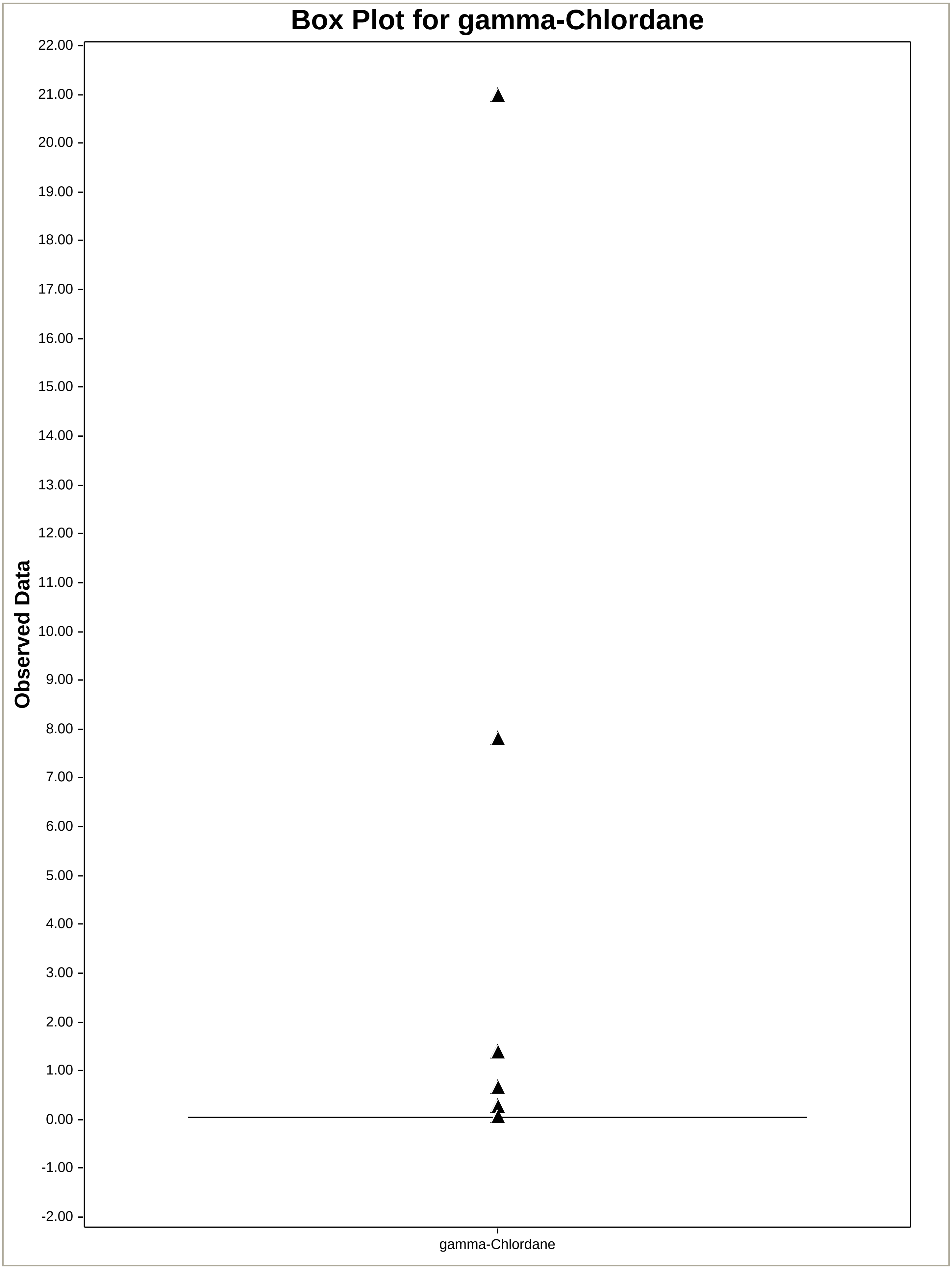

Box Plot for Endosulfan sulfate
Observed Data
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
Endosulfan sulfate


Box Plot for Endrin aldehyde
Observed Data
6.20
6.00
5.80
5.60
5.40
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
Endrin aldehyde

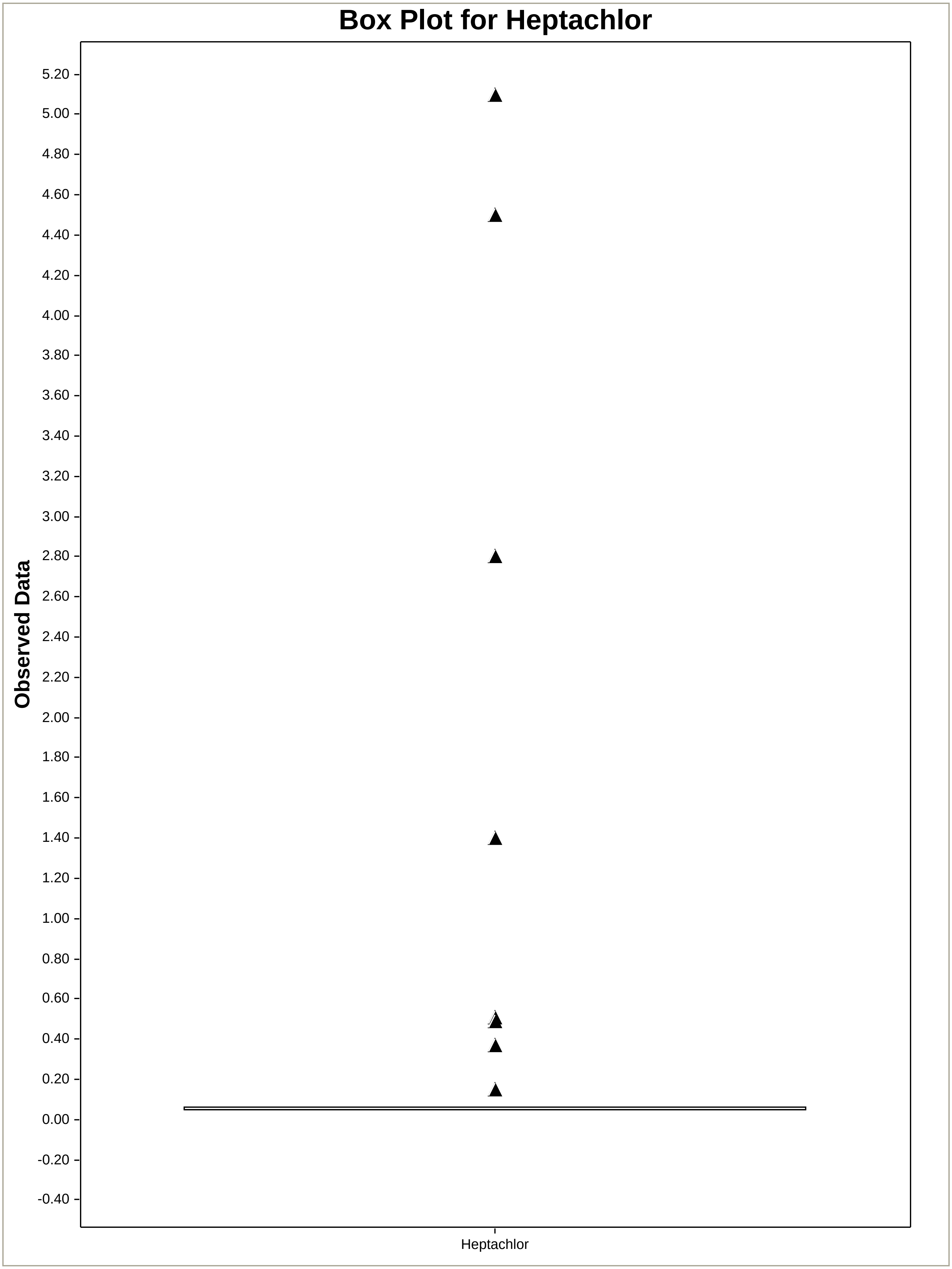

Box Plot for Ethylbenzene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Ethylbenzene

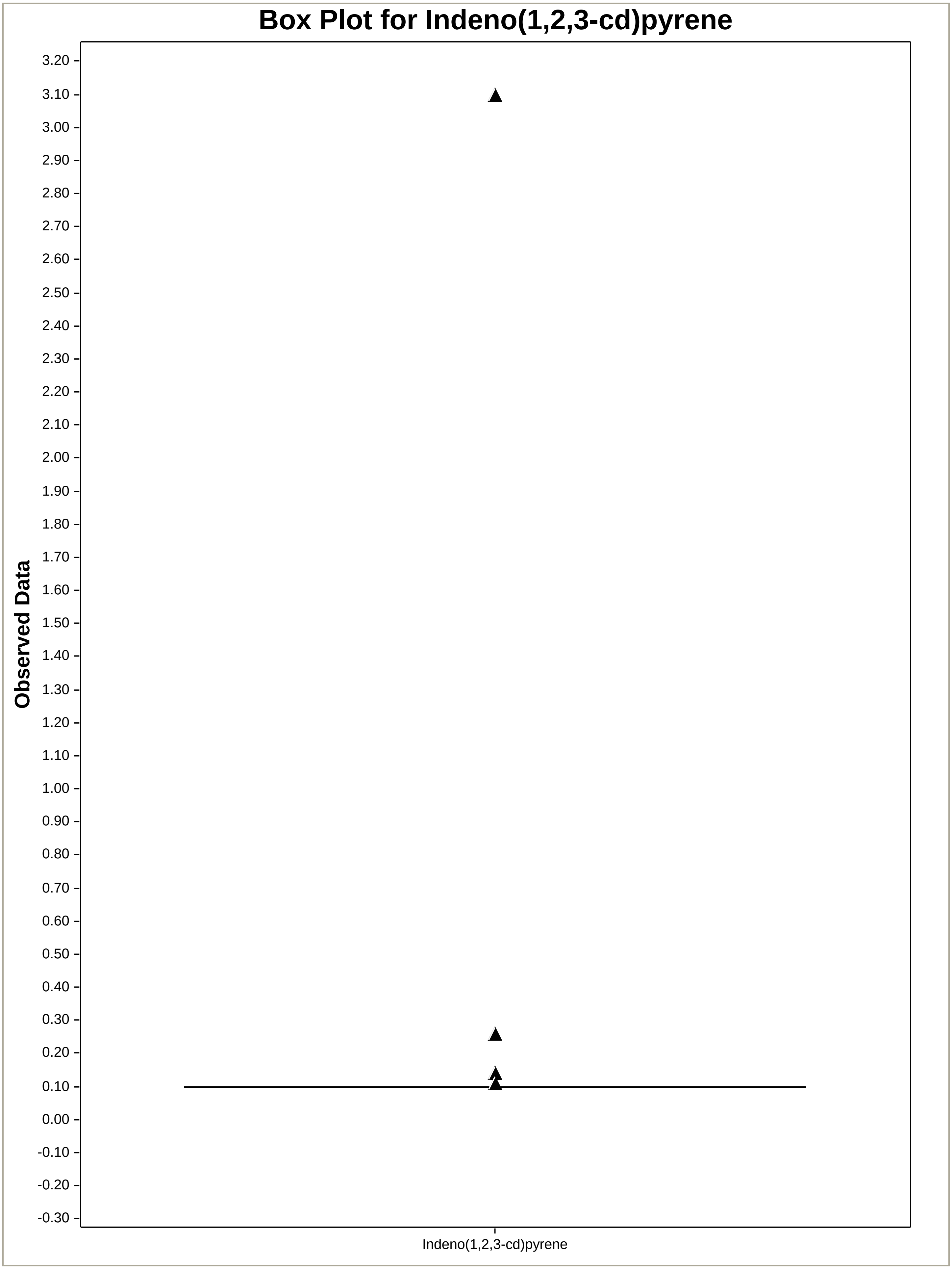


Box Plot for gamma-BHC
Observed Data
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
gamma-BHC

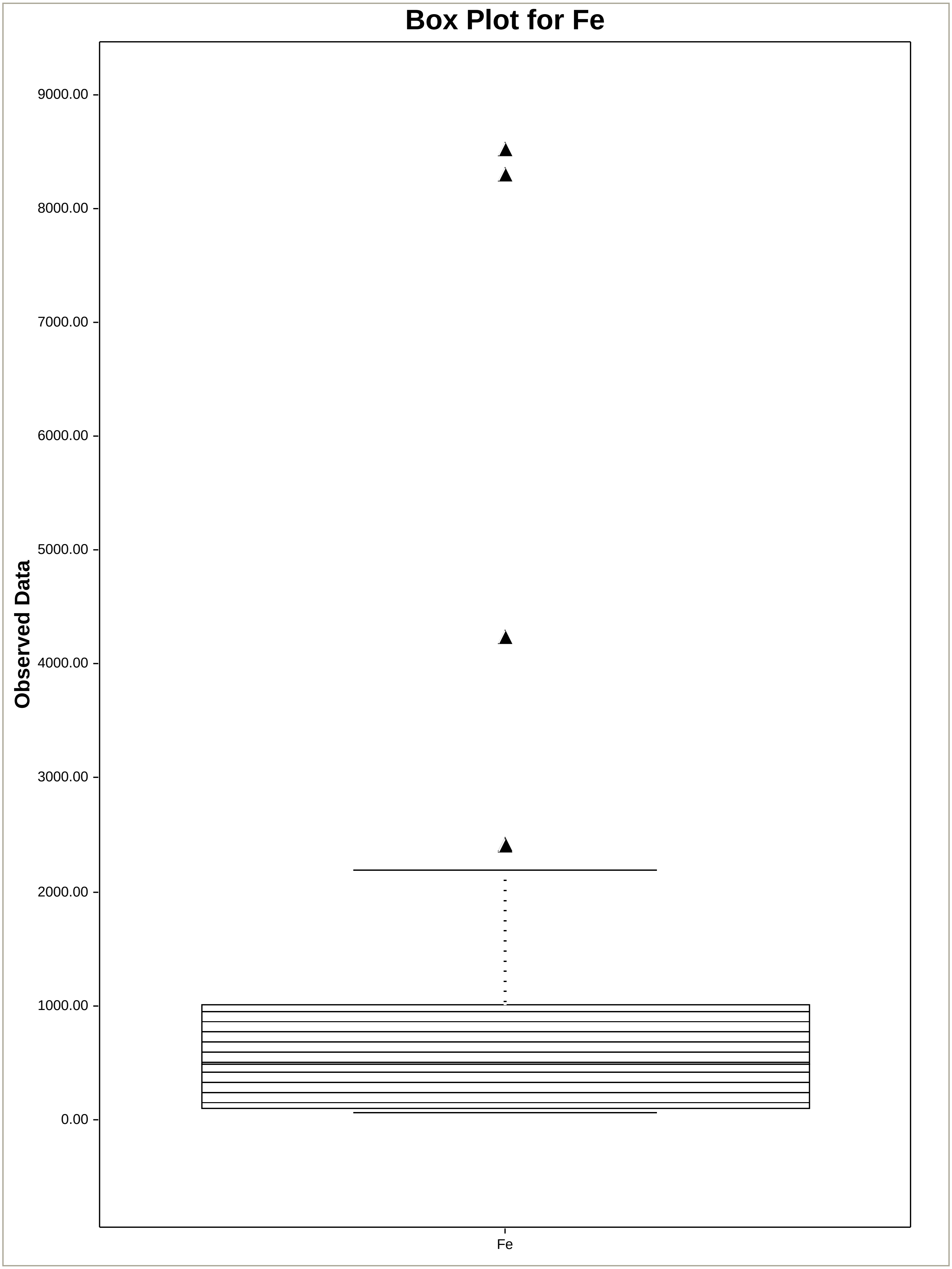


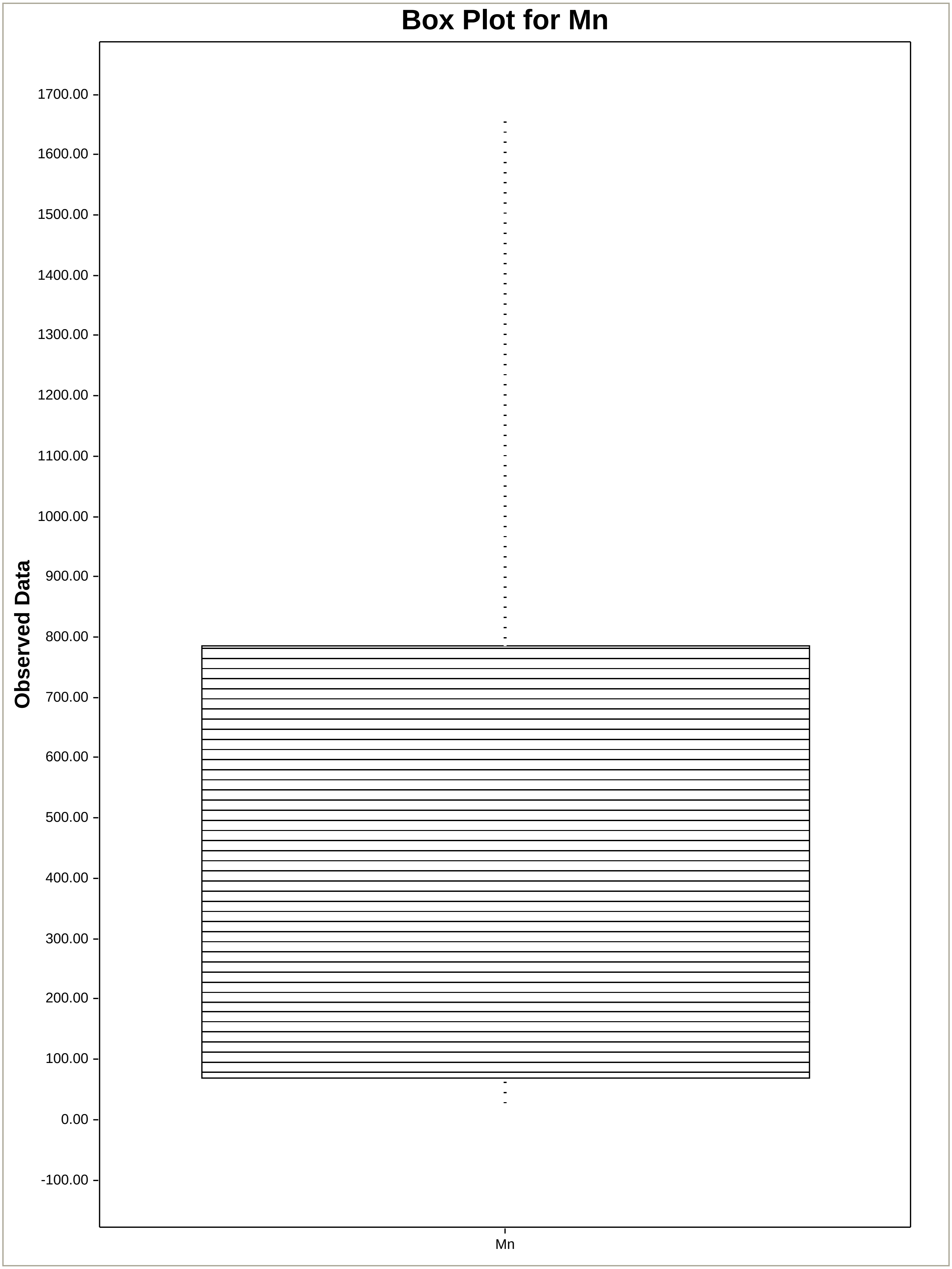
Box Plot for gamma-Chlordane
Observed Data
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
gamma-Chlordane

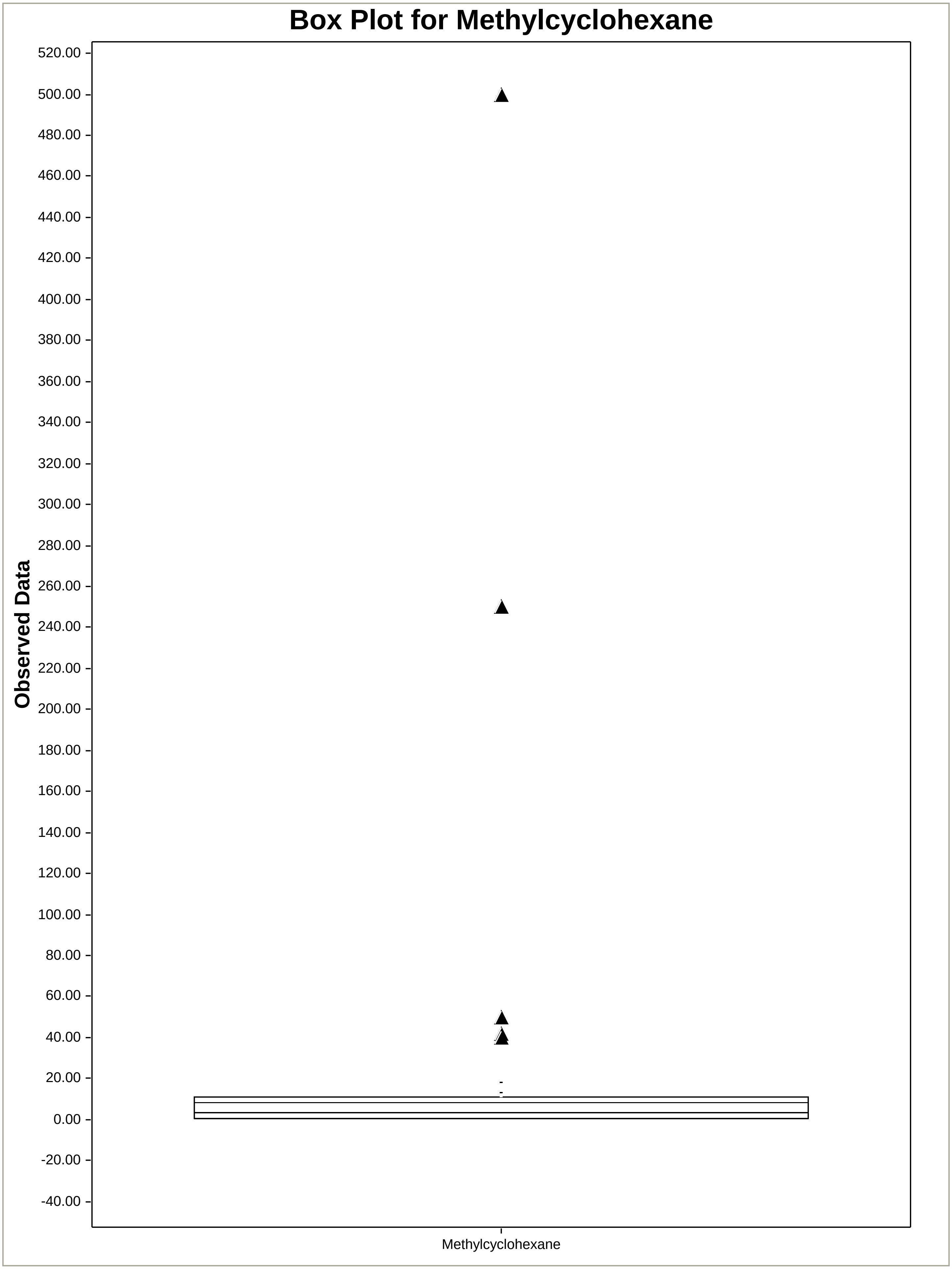

Box Plot for Heptachlor
Observed Data
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
Heptachlor

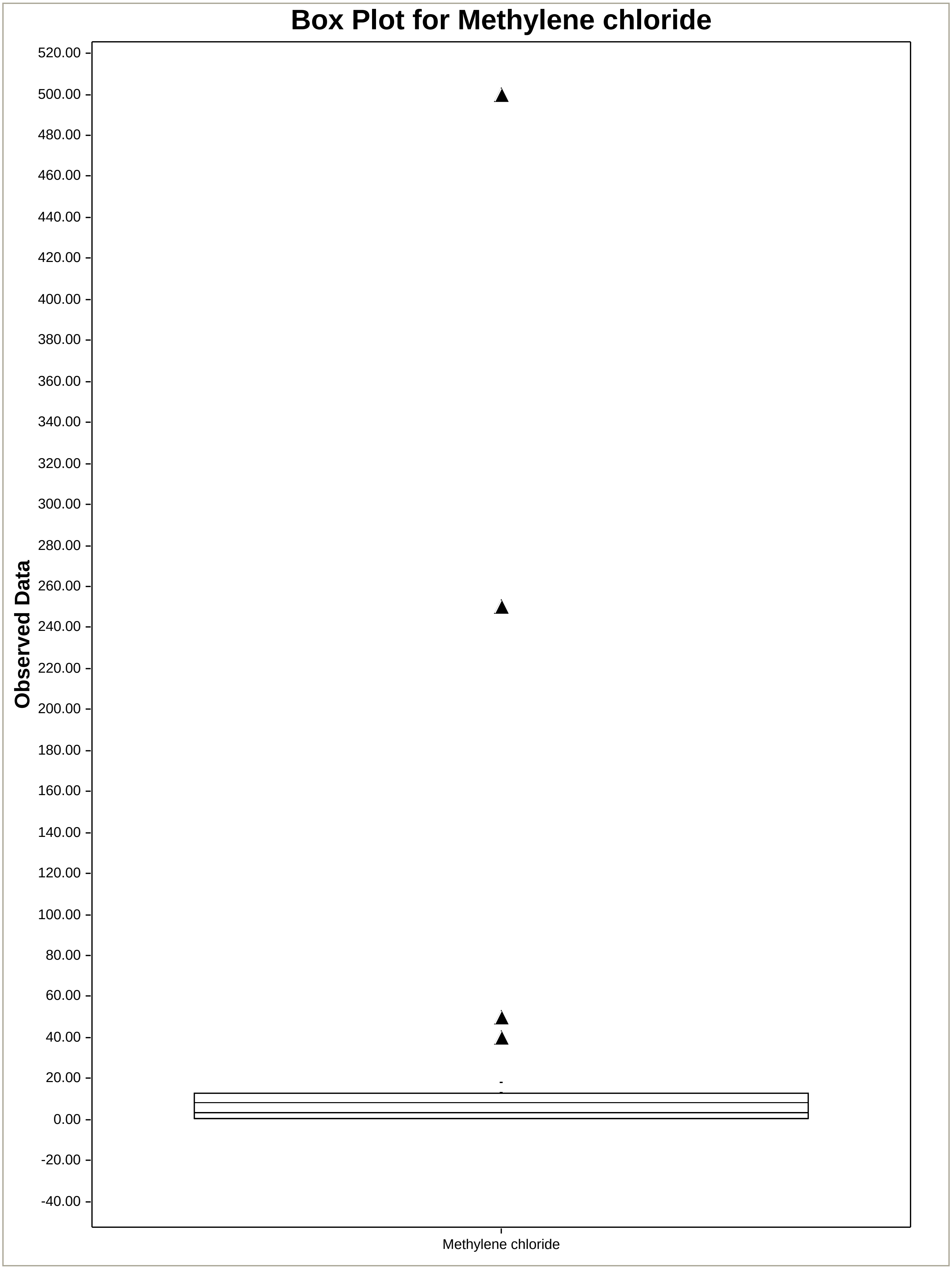


Box Plot for Indeno(1,2,3-cd)pyrene
Observed Data
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
2.20
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
Indeno(1,2,3-cd)pyrene

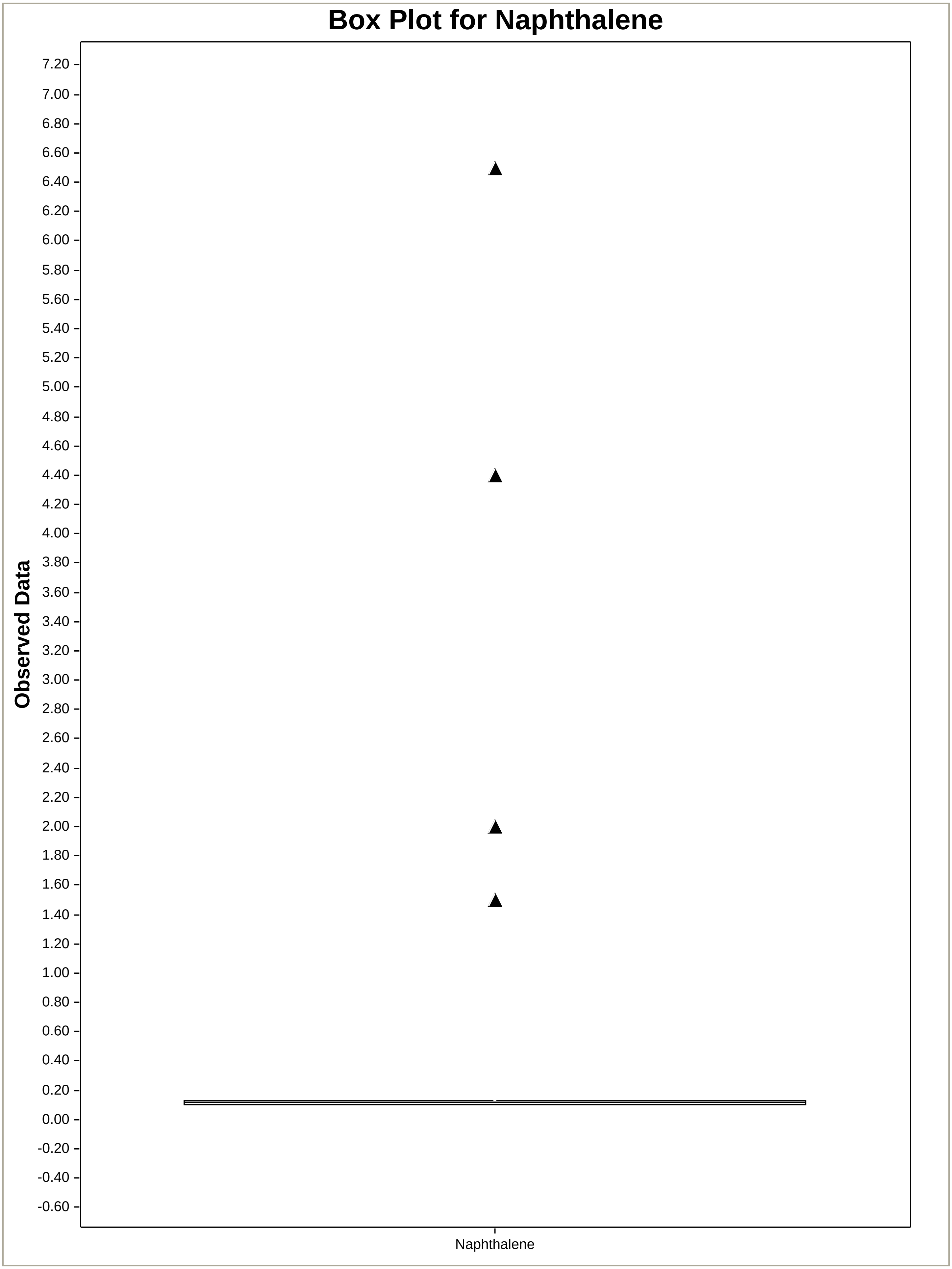

Box Plot for Fe
Observed Data
9000.00
8000.00
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
Fe

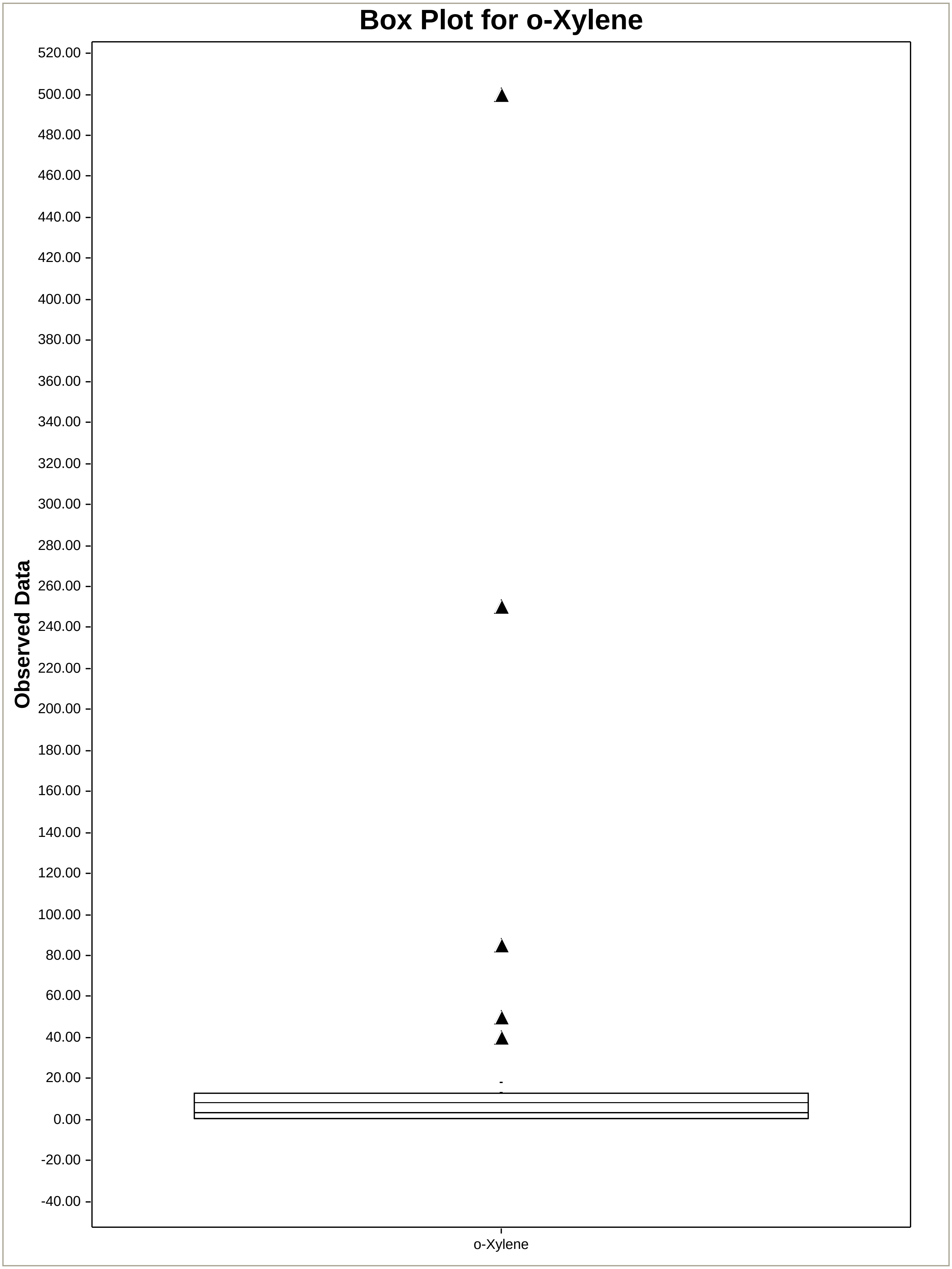

Box Plot for Mn
Observed Data
1700.00
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
Mn

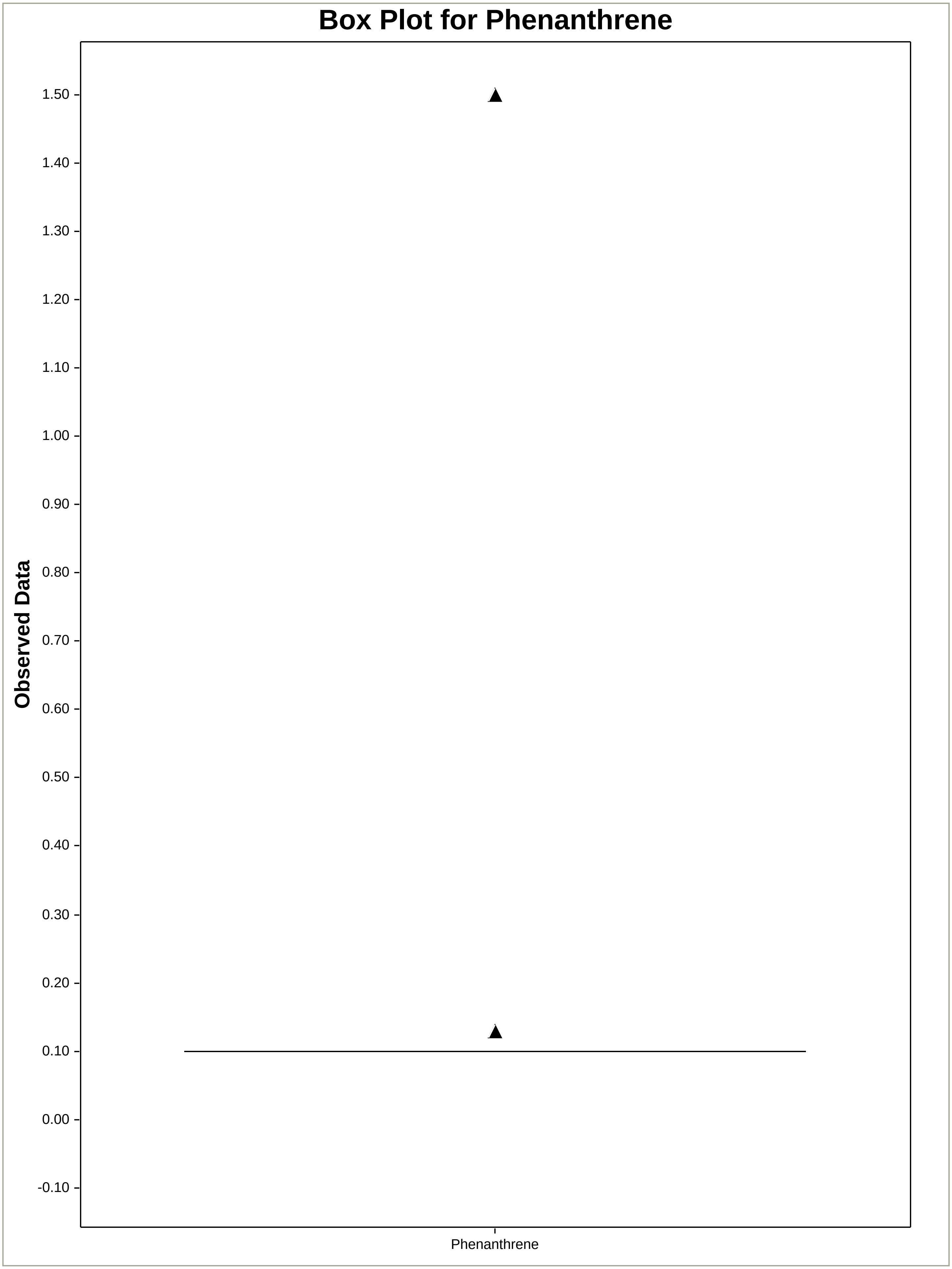

Box Plot for Methylcyclohexane
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Methylcyclohexane



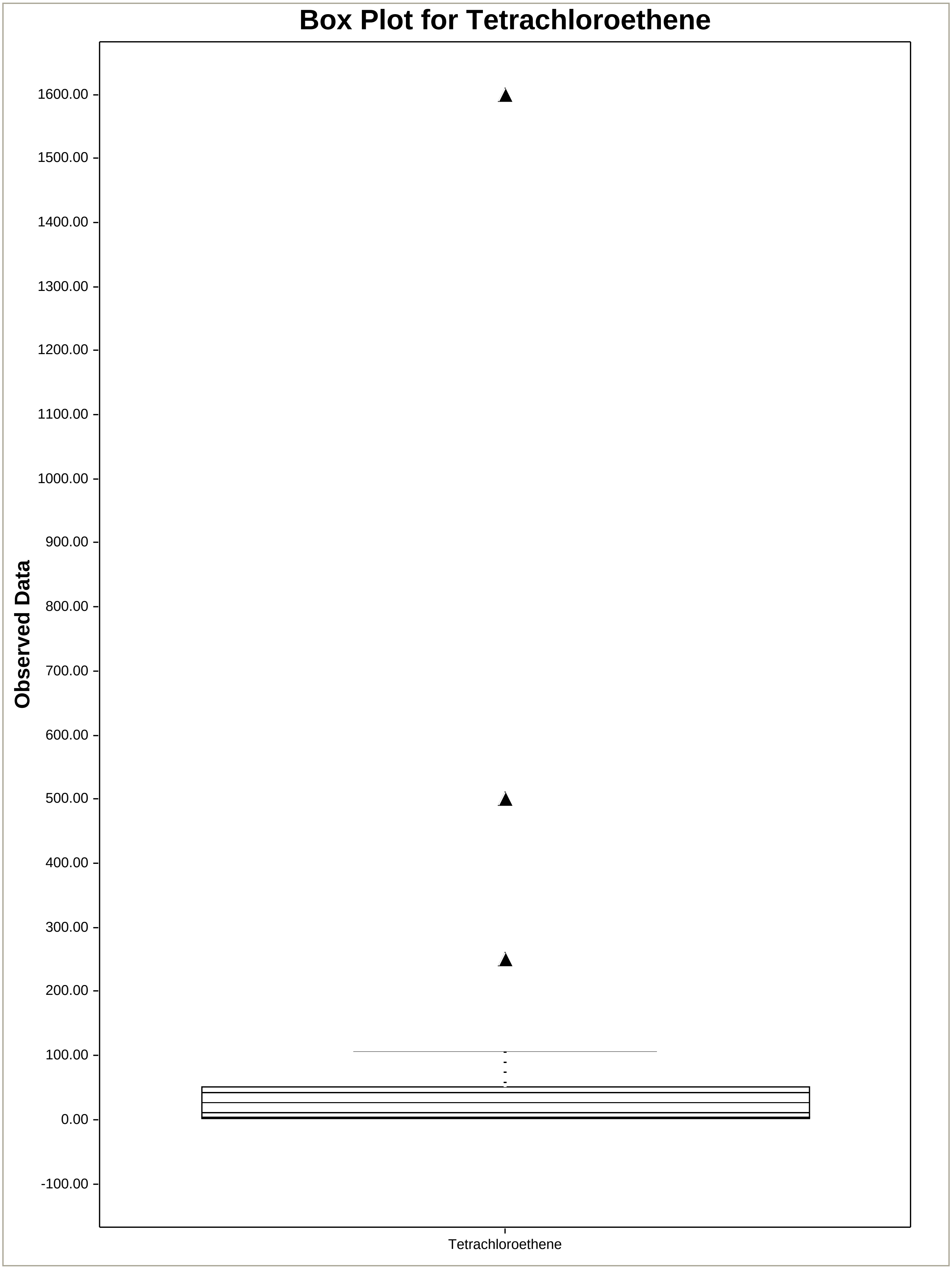
Box Plot for Methylene chloride
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
Methylene chloride

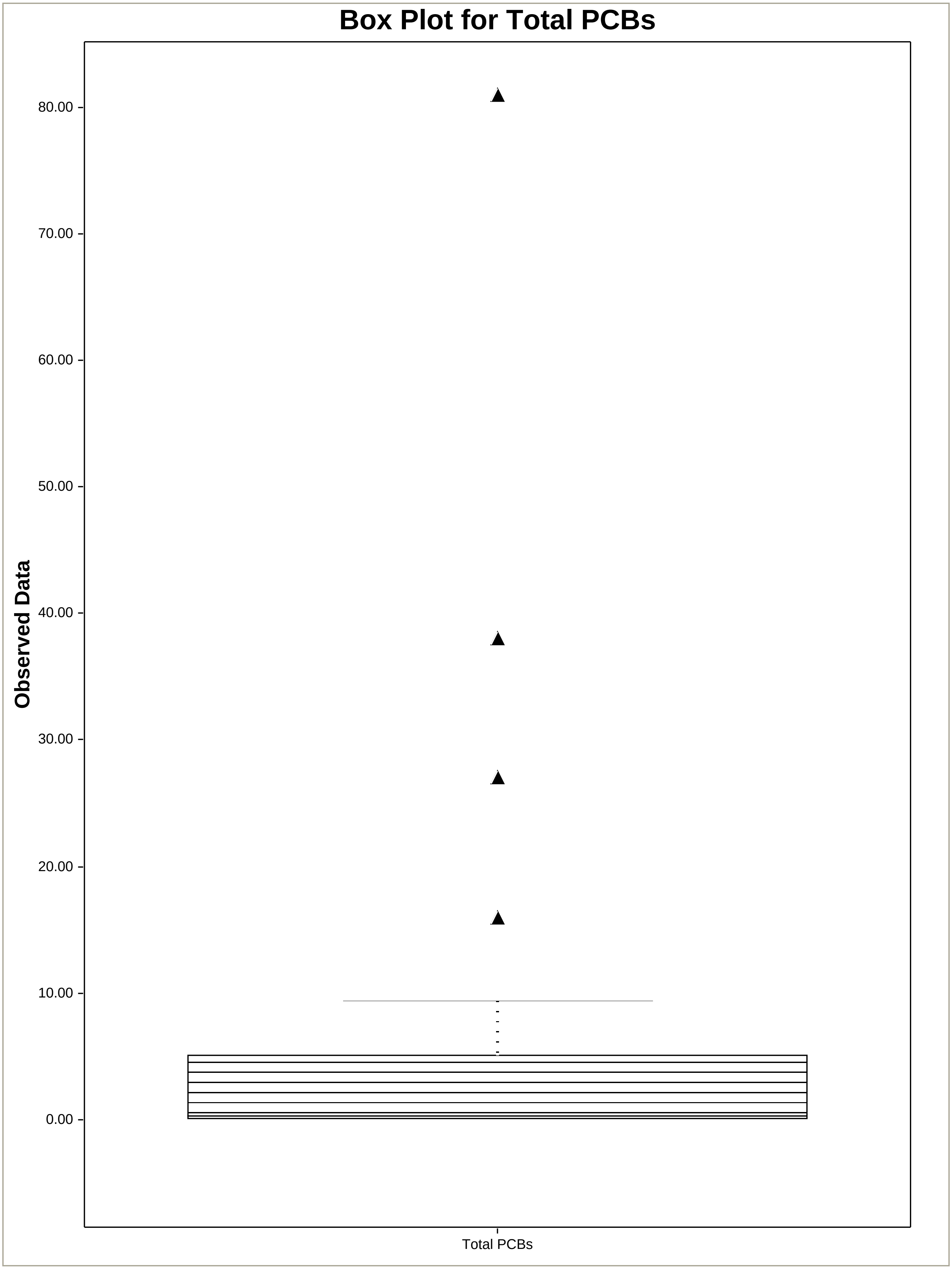

Box Plot for Naphthalene
Observed Data
7.20
7.00
6.80
6.60
6.40
6.20
6.00
5.80
5.60
5.40
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
Naphthalene

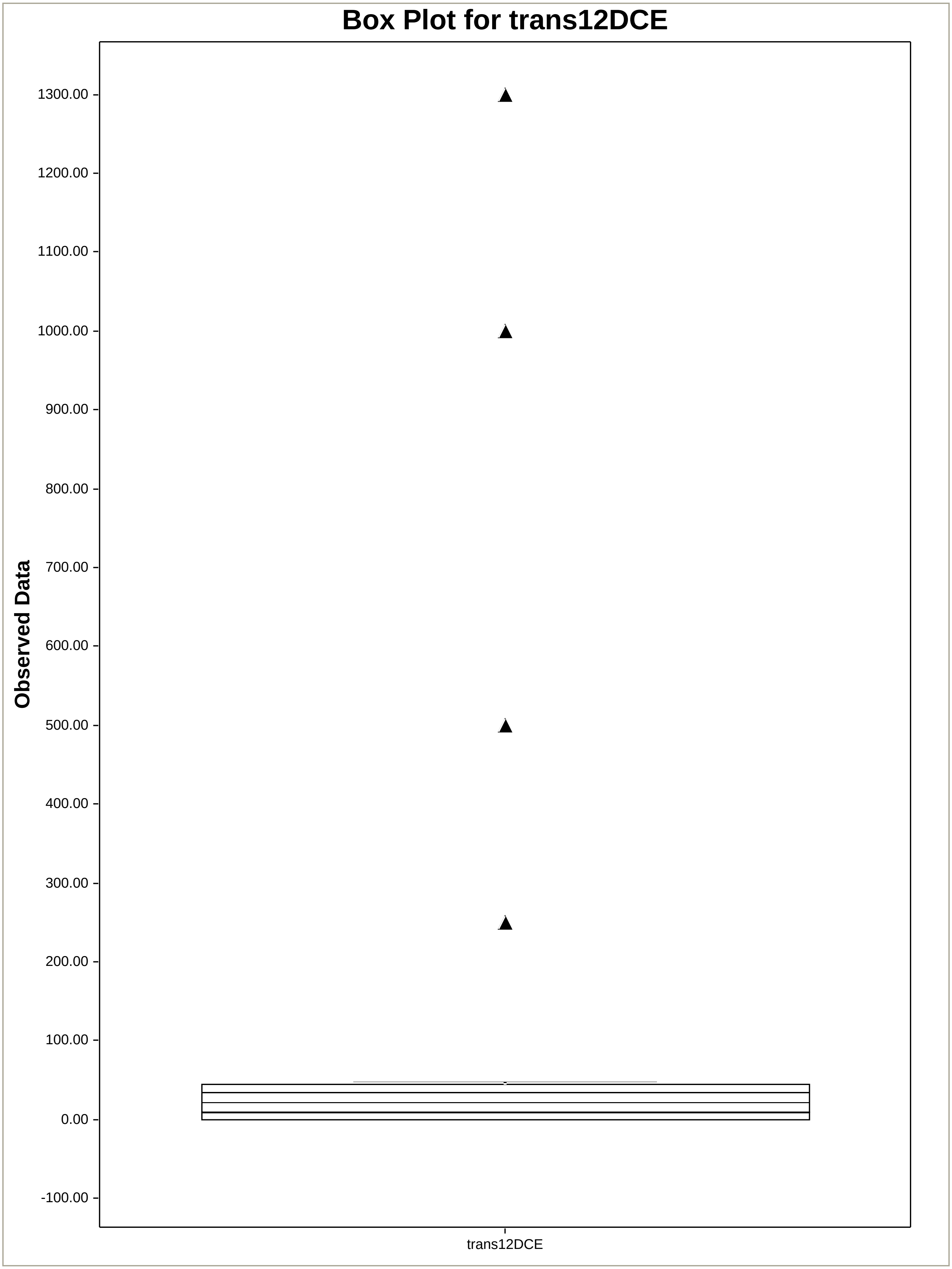

Box Plot for o-Xylene
Observed Data
520.00
500.00
480.00
460.00
440.00
420.00
400.00
380.00
360.00
340.00
320.00
300.00
280.00
260.00
240.00
220.00
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
o-Xylene

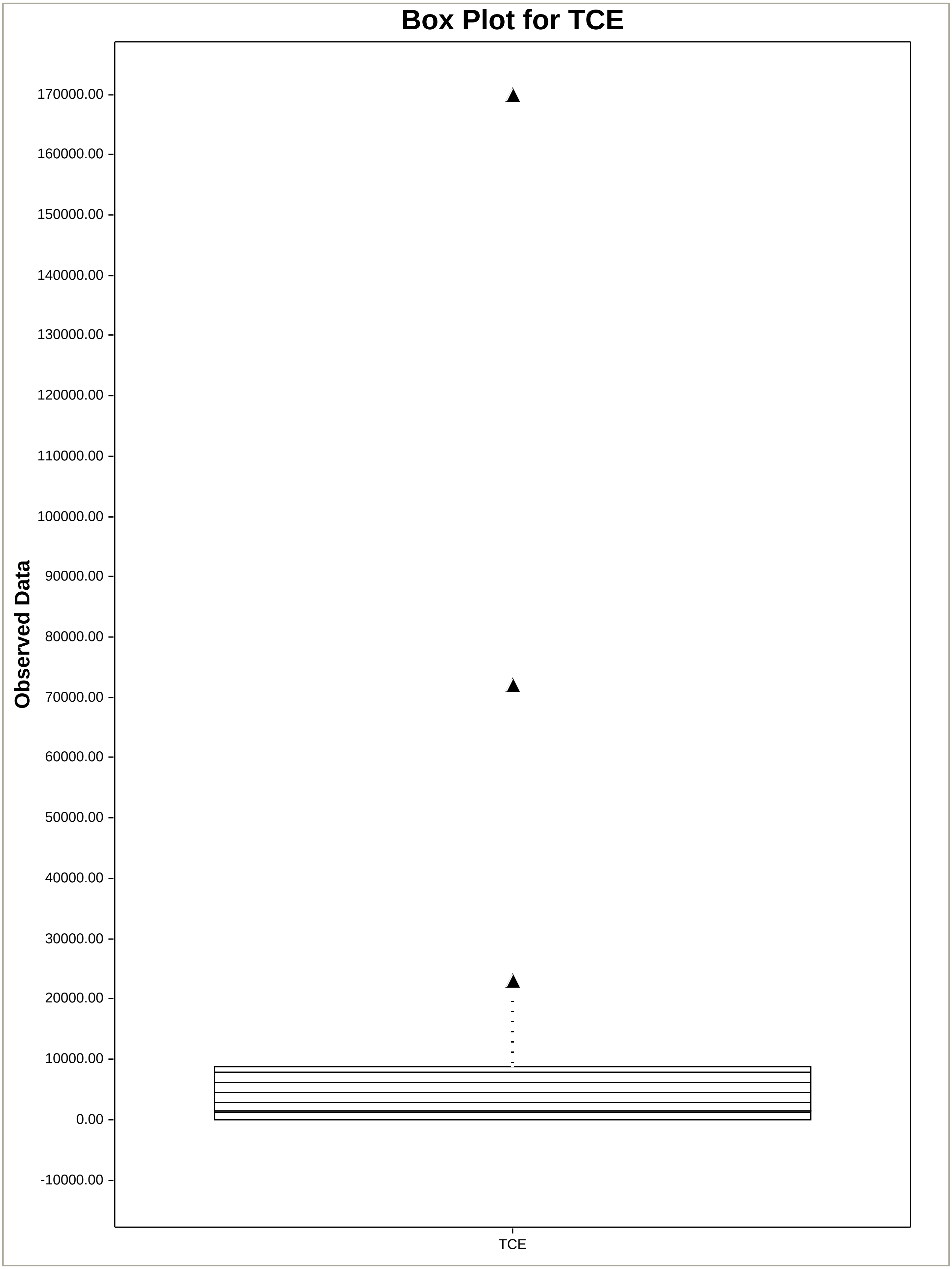


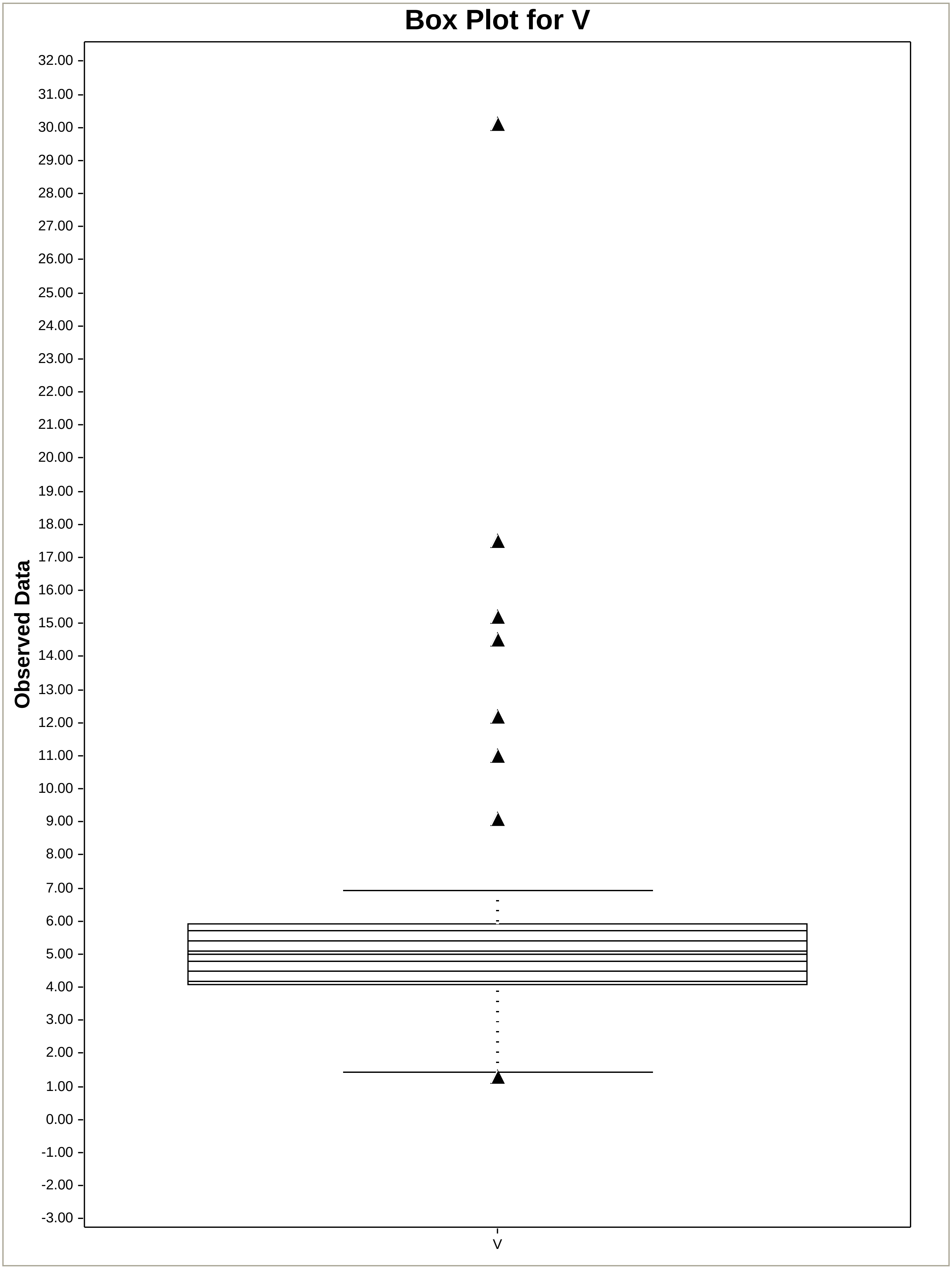
Box Plot for Phenanthrene
Observed Data
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
Phenanthrene

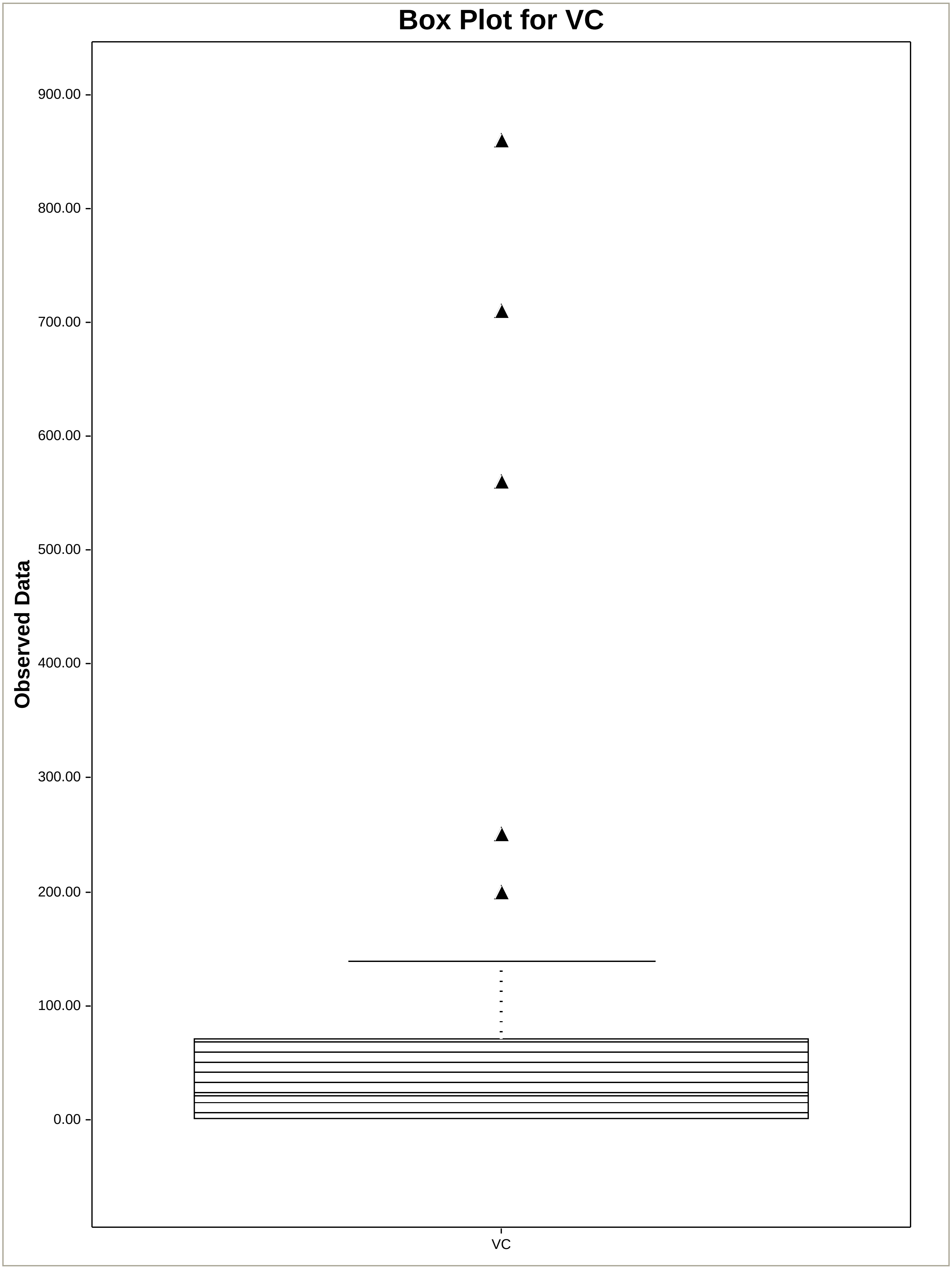

Box Plot for Tetrachloroethene
Observed Data
1600.00
1500.00
1400.00
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
Tetrachloroethene


Box Plot for Total PCBs
Observed Data
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Total PCBs


Box Plot for trans12DCE
Observed Data
1300.00
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
trans12DCE


Box Plot for TCE
Observed Data
170000.00
160000.00
150000.00
140000.00
130000.00
120000.00
110000.00
100000.00
90000.00
80000.00
70000.00
60000.00
50000.00
40000.00
30000.00
20000.00
10000.00
0.00
-10000.00
TCE


Box Plot for V
Observed Data
32.00
31.00
30.00
29.00
28.00
27.00
26.00
25.00
24.00
23.00
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
V



Box Plot for VC
Observed Data
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
VC

APPENDIX E

Exposure Assessment Modeling Equations and Assumptions

APPENDIX E

Exposure Assessment Modeling
Equations and Assumptions

- **Volatile Chemical Release to Air from Process/Industrial Uses of Groundwater**
- **Volatile Chemical Release to Outdoor Air during Construction/Utility Work**
- **Volatile Chemical Release to Indoor Air during Showering**
- **Dermal Exposure Assessment Worksheets**
- **RAGS D IEUBK Lead Worksheet**

VOLATILE CHEMICAL RELEASE TO AIR FROM PROCESS / INDUSTRIAL USES OF GROUNDWATER

The methodology to evaluate the potential exposure of commercial/industrial workers to volatile COPCs in groundwater is described below.

A modified version of "the Schaum model" (Schaum et al., 1992) was used to estimate concentrations of volatile COPCs in building air during and after the use of groundwater for process/industrial activities (e.g., to wash vehicles or equipment). The Schaum model was developed to estimate concentrations of volatile chemicals in bathroom air during and after showering. This model, however, can be modified to estimate concentrations of volatile chemicals in other types of spaces. As the model essentially addresses the spraying of water (showering) and subsequent release and dispersion of volatile chemicals in a confined space (bathroom), it can be modified for other types of water spraying scenarios.

The Schaum model was modified for this exposure assessment by assuming a truck washing scenario, as follows. A truck with dimensions of 75 feet long by 10 feet wide by 14 feet high is washed using a pressure washer (using 4 gallons of water per minute) in a one-story building of appropriate dimensions (100 feet long by 20 feet wide by 20 feet high). It was further assumed that 1 hour is required to clean each truck [with the time over which spraying occurs (t1) equal to 0.5 hours and the time after spraying (t2) equal to 0.5 hours], that the air in the building is completely exchanged between truck washing cycles, and that eight trucks are cleaned in a typical work day.

The Schaum model is a realistic yet simple model that treats the building as one compartment and yields air concentrations averaged over the time of the actual spraying and the time spent in the building subsequent to the spraying. It was assumed that the chemicals volatilize at a constant rate, instantly mix uniformly with the building air, and that ventilation with clean air does not occur within a given wash cycle. This implies that the chemical concentrations in air increase linearly from zero to a maximum at the end of the spraying and then remain constant during the time an individual spends in the building immediately after the spraying.

The average concentration of a volatile chemical in the building air over a period of t_s hours (for $t_s > 0$) was estimated from the following equation:

$$C_a = \frac{\left(\frac{C_{a,max}}{2} \times t_1\right) + \left(C_{a,max} \times t_2\right)}{\left(t_1 + t_2\right)}$$

where:

C_a = The concentration of a volatile chemical in the building air over a duration of t_s hours, mg/m^3
$C_{a,max}$ = The maximum concentration of a volatile chemical in the building air, mg/m^3
t_1 = The time over which spraying occurs, hr
t_2 = The time after spraying, hr
t_s = The time in the building during (t_1) and after (t_2) the spraying, hr

and where:

$$C_{a,max} = \frac{C_w \times f \times F_w \times t_1}{V_a}$$

where:
C_w = The water concentration, mg/L
f = The fraction volatilized, unitless
F_w = The water flow rate, 908 L/hr
V_a = The building volume, 1,133 m^3

The fraction volatilized is the mass fraction of the chemical in water that volatilizes over the course of the spraying and is a chemical-specific value that is not easily predicted. The volatilization rates depend on properties such as Henry's Law constant and molecular weight. Volatilization fractions ranging from 0.5 to 0.9 have been reported in studies using trichloroethene and chloroform. This range is assumed to be representative of all other volatile chemicals with Henry's Law constants that are similar or greater. Consistent with USEPA Region 2 guidance, for all volatile COPCs (regardless of their Henry's Law Constants), a volatilization fraction of 0.9 was used to model reasonable maximum exposure (RME), and a volatilization fraction of 0.5 was used under the central tendency exposure (CTE) scenario.

The Schaum model and resultant building air concentrations used to evaluate commercial/industrial worker exposure to volatile COPCs in groundwater are presented in **Table E-1**.

REFERENCES

Schaum, J., K. Hoang, R. Kinerson, and J. Moya. 1992. Estimating Dermal and Inhalation Exposure to Volatile Chemicals in Domestic Water. California Environmental Protection Agency. Sacramento, CA.

VOLATILE CHEMICAL RELEASE FROM GROUNDWATER TO OUTDOOR AIR DURING CONSTRUCTION/UTILITY WORK

The methodology to evaluate the potential exposure of construction/utility workers to volatile COPCs in shallow groundwater is described below.

The depth to groundwater varies seasonally, and in some portions of the Site at certain times of the year, the water table may be only a few feet below ground surface (see Table 4-2 in the Remedial Investigation Report). Emissions of the volatile COPCs in groundwater were estimated under the assumption that shallow groundwater infiltrates a completed excavation for underground utility maintenance or repair, and volatile COPCs are released from pooled water at the bottom of the excavation. The exposure modeling required determination of COPC emission fluxes and concentrations in outdoor air above the excavation.

The following calculations and resultant outdoor air concentrations used to evaluate construction/utility worker exposure to volatile COPCs in shallow groundwater are presented in **Table E-2** (for shallow onsite groundwater), **Table E-3** (for shallow offsite groundwater, south of Bound Brook), and **Table E-4** (for shallow offsite groundwater, north of Bound Brook).

Emission Fluxes

The potential for volatile COPC emissions was evaluated based on the EPCs for those chemicals in groundwater, as presented in Appendix A, RAGS Part D Table 3.2, Table 3.3, and Table 3.4.

The following equation (USEPA, 1995a) was used to determine emission fluxes (in g/sec-m^2) from pooled water at the bottom of the excavation:

$$F_i = K_i \times C_{Li} \times CF1$$

where:

F_i	= Maximum emission flux of chemical i, g/sec-m^2
K_i	= Overall mass transfer coefficient of chemical i, cm/sec
C_{Li}	= Liquid-phase concentration of chemical i, g/cm^3
CF1	= Conversion factor, 1E+04 cm^2/m^2

and where:

$$\frac{1}{K_i} = \left(\frac{1}{k_{i,L}}\right) + \left(\frac{R \times T_s}{H_i \times k_{i,G}}\right)$$

where:

$k_{i,L}$ = Liquid-phase mass transfer coefficient of chemical i, cm/sec
R = Ideal gas constant, 8.2E-05 atm-m^3/mole-K
T_s = System temperature, 284 K
H_i = Henry's Law constant of chemical i, atm-m^3/mole
$k_{i,G}$ = Gas-phase mass transfer coefficient of constituent i, cm/sec

and where:

$$k_{i,L} = \left(\frac{MW_{O_2}}{MW_i}\right)^{0.5} \times \left(\frac{T_s}{298K}\right) \times k_L, O_2$$

where:

MW_{O_2} = Molecular weight of oxygen, 32.0 g/mol
MW_i = Molecular weight of constituent i, g/mol
T_s = System temperature, 284 K
k_L, O_2 = Liquid-phase mass transfer coefficient of oxygen at 25ºC, 0.002 cm/sec

and where:

$$k_{i,G} = \left(\frac{MW_{H_2O}}{MW_i}\right)^{0.335} \times \left(\frac{T_s}{298K}\right)^{1.005} \times k_G, H_2O$$

where:

MW_{H_2O} = Molecular weight of water, 18.0 g/mol
k_G, H_2O = Gas-phase mass transfer coefficient of water vapor at 25ºC, 0.833 cm/sec

Outdoor Air Concentrations

Outdoor air concentrations of the volatile COPC emissions were determined using the USEPA-approved Point, Area and Line source (PAL2.1) model, version 89272 (USEPA, 1992), assuming that the excavation represents an area source of emissions. PAL2.1 has the capability of determining impacts above area sources, as well as downwind of a source. PAL2.1 is a multi-purpose model that can be used to estimate dispersion for point, area and line sources using Gaussian-plume steady-state assumptions. User-specified meteorological options allow for input of site-specific conditions that are representative of the site being modeled.

For this evaluation, it was assumed the excavated trench measures 1.5 m wide x 5.0 m long x 3.0 m deep. The pooled water surface was therefore modeled as a 1.5 m x 5.0 m flat area source. Nine receptors were used in the analysis. Eight receptors were placed along the edge of the excavation: one at each of the four corners, and one at the center of each side. In addition, one receptor was placed over the center of the excavation. All receptors were modeled at a height of 1.8 meters to simulate the height of a construction/utility worker.

The meteorological data consisted of an array of 54 meteorological conditions used in the USEPA-approved screening level model, SCREEN3 (USEPA, 1995b). These conditions represent 54 combinations of stability classes (1 to 6) and wind speeds (1 m/s to 20 m/s) that routinely occur in the atmosphere. The wind directions were set so that the wind blew directly toward each of the receptors. Model options selected for the analysis included a typical anemometer height of 6.1 meters, a mixing height of 5000 m, and an average temperature of 293 K. The wind was assumed to be constant below a height of 10 meters (as fixed by PAL2.1). Land use was classified as urban. The emission rate of the area source was set at 1 g/s-m^2. Output was then in the form of µg/m^3 per g/s-m^2.

The modeling analysis predicted a maximum 1-hour average unitized impact of 1.30E-01 g/m^3 per g/s-m^2. The maximum 1-hour average chemical concentrations (in mg/m^3) in the outdoor air at the excavation ($C_{outdoor,GW}$) were calculated from the following equation:

$$C = \text{Maximum 1-hour average unitized impact} \times F_i \times CF2$$

where:

C	= Maximum 1-hour average chemical concentration in outdoor air, mg/m^3
F_i	= Emission flux, g/s-m^2
CF2	= Conversion factor, 1E-03 mg/µg

REFERENCES

U.S. Environmental Protection Agency. 1995a. Guideline for Predictive Baseline Emissions Estimation for Superfund Sites. Interim Final. EPA-451/R-96-001. Air/Superfund National Technical Guidance Study Series. Office of Air Quality Planning and Standards, Research Triangle Park, NC. (November 1995).

U.S. Environmental Protection Agency. 1995b. SCREEN3 Model and Users Guide. EPA-454/B-95-004. Research Triangle Park, NC.

U.S. Environmental Protection Agency. 1992. PAL2.1: A Gaussian-Plume Algorithm for Point, Area, and Line Sources. Version 89272.

VOLATILE CHEMICAL RELEASE TO INDOOR AIR DURING SHOWERING

The concentrations of volatile COPCs in bathroom air during and after showering were estimated using an approach, "the Schaum model," recommended by the USEPA, Region 2. The Schaum model (Schaum et al., 1992) is a realistic yet simple model that treats the bathroom as one compartment and yields air concentrations averaged over the time of the actual shower and the time spent in the bathroom following the shower. It is assumed that chemicals volatilize at a constant rate, instantly mix uniformly with the bathroom air, and that ventilation with clean air does not occur. This implies that the chemical concentrations in the air increase linearly from zero to a maximum at the end of the shower and then remain constant during the time an individual spends in the bathroom immediately after the shower.

The average concentration of a volatile chemical in the shower air over a period of t_s hours (for $t_s > 0$) was estimated from the following equation:

$$C_a = \frac{\left(\frac{C_{a,max}}{2} \times t_1\right) + \left(C_{a,max} \times t_2\right)}{\left(t_1 + t_2\right)}$$

where:

C_a = The concentration of a volatile chemical in the bathroom air over a duration of t_s hours, mg/m^3

$C_{a,max}$ = The maximum concentration of a volatile chemical in the bathroom air, mg/m^3

t_1 = The time of shower, hr

t_2 = The time after shower, hr

t_s = The time in the bathroom during (t_1) and after (t_2) the shower, hr

and where:

$$C_{a,max} = \frac{C_w \times f \times F_w \times t_1}{V_a}$$

where:

C_w = The water concentration, mg/L

f = The fraction volatilized, unitless

F_w = The water flow rate, 500 L/hr

V_a = The bathroom volume, 16 m^3

The fraction volatilized is the mass fraction of the chemical in water that volatilizes over the course of the shower. The volatilization rates depend on properties such as Henry's Law constant and molecular weight. Volatilization fractions ranging from 0.5 to 0.9 have been reported in studies using trichloroethene and chloroform. This range is assumed to be representative of all other volatile chemicals with Henry's Law constants which are similar or greater. Consistent with USEPA Region 2 guidance, for all volatile COPCs (regardless of their Henry's Law Constants), a volatilization fraction of 0.9 was used to model reasonable maximum exposure (RME), and a volatilization fraction of 0.5 was used under the central tendency exposure (CTE) scenario.

The Schaum model and resultant concentrations in shower/bathroom air are shown in **Table E-5** and **Table E-6** for resident adults and resident children, respectively.

REFERENCES

Schaum, J., K. Hoang, R. Kinerson, and J. Moya. 1992. Estimating Dermal and Inhalation Exposure to Volatile Chemicals in Domestic Water. California Environmental Protection Agency. Sacramento, CA.

TABLE E-1 (RME)
INDUSTRIAL/PROCESS USE SCENARIO - COMMERCIAL/INDUSTRIAL WORKER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical	Concentration in Water C_w (mg/L)	Henry's Law Constant H (unitless)	Henry's Law Constant H (atm-m^3/mol)	Diffusion Coefficient in Water D_w (m^2/sec)	Diffusion Coefficient in Air D_a (m^2/sec)	Fraction Volatilized f (unitless)	Flow Rate of Pressure Washer F_w (L/hr)	Time of t_1 (hours)	Time after t_2 (hours)	Bldg Room Volume V_a (m^3)	Max Concentration in Building Air $C_{a,max}$ (mg/m^3)	Concentration in Air C_a (µg/m^3)
Benzene	7.2E-04	2.3E-01	5.6E-03	9.8E-06	8.8E-02	0.9	908	4	4	1,133	2.1E-03	1.6E+00
Bromodichloromethane	4.1E-04	6.6E-02	1.6E-03	1.1E-05	3.0E-02	0.9	908	4	4	1,133	1.2E-03	8.8E-01
Chlorobenzene	3.7E-03	1.5E-01	3.7E-03	8.7E-06	7.3E-02	0.9	908	4	4	1,133	1.1E-02	8.0E+00
Chloroform	2.8E-03	1.5E-01	3.7E-03	1.0E-05	1.0E-01	0.9	908	4	4	1,133	8.0E-03	6.0E+00
Dibromochloromethane	3.4E-04	3.2E-02	7.8E-04	1.1E-05	2.0E-02	0.9	908	4	4	1,133	9.9E-04	7.4E-01
1,2-Dichlorobenzene	2.1E-03	7.8E-02	1.9E-03	7.9E-06	6.9E-02	0.9	908	4	4	1,133	6.2E-03	4.6E+00
1,3-Dichlorobenzene	5.2E-03	1.1E-01	2.6E-03	7.9E-06	6.9E-02	0.9	908	4	4	1,133	1.5E-02	1.1E+01
1,4-Dichlorobenzene	5.0E-03	1.0E-01	2.4E-03	7.9E-06	6.9E-02	0.9	908	4	4	1,133	1.4E-02	1.1E+01
1,1-Dichloroethane	7.0E-04	2.3E-01	5.6E-03	1.1E-05	7.4E-02	0.9	908	4	4	1,133	2.0E-03	1.5E+00
1,2-Dichloroethane	5.6E-04	4.0E-02	9.8E-04	9.9E-06	1.0E-01	0.9	908	4	4	1,133	1.6E-03	1.2E+00
1,1-Dichloroethene	5.7E-03	1.1E+00	2.6E-02	1.0E-05	9.0E-02	0.9	908	4	4	1,133	1.7E-02	1.2E+01
cis-1,2-Dichloroethene	1.4E+01	1.7E-01	4.1E-03	1.1E-05	7.4E-02	0.9	908	4	4	1,133	4.1E+01	3.1E+04
trans-1,2-Dichloroethene	6.1E-02	3.9E-01	9.4E-03	1.2E-05	7.1E-02	0.9	908	4	4	1,133	1.8E-01	1.3E+02
Methyl tert-butyl ether	1.3E-02	2.4E-02	5.9E-04	8.6E-06	7.5E-02	0.9	908	4	4	1,133	3.6E-02	2.7E+01
Methylene chloride	5.0E-04	9.0E-02	2.2E-03	1.2E-05	1.0E-01	0.9	908	4	4	1,133	1.5E-03	1.1E+00
Tetrachloroethene	3.6E-02	7.5E-01	1.8E-02	8.2E-06	7.2E-02	0.9	908	4	4	1,133	1.0E-01	7.8E+01
1,2,3-Trichlorobenzene	8.5E-03	5.1E-02	1.2E-03	8.4E-06	4.0E-02	0.9	908	4	4	1,133	2.4E-02	1.8E+01
1,2,4-Trichlorobenzene	5.8E-02	5.8E-02	1.4E-03	8.2E-06	3.0E-02	0.9	908	4	4	1,133	1.7E-01	1.3E+02
1,1,2-Trichloroethane	3.9E-03	3.7E-02	9.1E-04	8.8E-06	7.8E-02	0.9	908	4	4	1,133	1.1E-02	8.4E+00
Trichloroethene	7.0E+00	4.2E-01	1.0E-02	9.1E-06	7.9E-02	0.9	908	4	4	1,133	2.0E+01	1.5E+04
Vinyl chloride	5.3E-02	1.1E+00	2.7E-02	1.2E-06	1.1E-01	0.9	908	4	4	1,133	1.5E-01	1.2E+02
Naphthalene	3.4E-04	2.0E-02	4.8E-04	7.5E-06	5.9E-02	0.9	908	4	4	1,133	9.8E-04	7.4E-01

Note: Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

TABLE E-1 (CT)
INDUSTRIAL/PROCESS USE SCENARIO - COMMERCIAL/INDUSTRIAL WORKER
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical	Concentration in Water C_w (mg/L)	Henry's Law Constant H (unitless)	Henry's Law Constant H (atm-m^3/mol)	Diffusion Coefficient in Water D_w (m^2/sec)	Diffusion Coefficient in Air D_a (m^2/sec)	Fraction Volatilized f (unitless)	Flow Rate of Pressure Washer F_w (L/hr)	Time of t_1 (hours)	Time after t_2 (hours)	Bldg Room Volume V_a (m^3)	Max Concentration in Building Air $C_{a,max}$ (mg/m^3)	Concentration in Air C_a (µg/m^3)
Benzene	7.2E-04	2.3E-01	5.6E-03	9.8E-06	8.8E-02	0.9	908	3	3	1,133	1.6E-03	1.2E+00
Bromodichloromethane	4.1E-04	6.6E-02	1.6E-03	1.1E-05	3.0E-02	0.9	908	3	3	1,133	8.8E-04	6.6E-01
Chlorobenzene	3.7E-03	1.5E-01	3.7E-03	8.7E-06	7.3E-02	0.9	908	3	3	1,133	8.0E-03	6.0E+00
Chloroform	2.8E-03	1.5E-01	3.7E-03	1.0E-05	1.0E-01	0.9	908	3	3	1,133	6.0E-03	4.5E+00
Dibromochloromethane	3.4E-04	3.2E-02	7.8E-04	1.1E-05	2.0E-02	0.9	908	3	3	1,133	7.4E-04	5.6E-01
1,2-Dichlorobenzene	2.1E-03	7.8E-02	1.9E-03	7.9E-06	6.9E-02	0.9	908	3	3	1,133	4.6E-03	3.5E+00
1,3-Dichlorobenzene	5.2E-03	1.1E-01	2.6E-03	7.9E-06	6.9E-02	0.9	908	3	3	1,133	1.1E-02	8.5E+00
1,4-Dichlorobenzene	5.0E-03	1.0E-01	2.4E-03	7.9E-06	6.9E-02	0.9	908	3	3	1,133	1.1E-02	8.1E+00
1,1-Dichloroethane	7.0E-04	2.3E-01	5.6E-03	1.1E-05	7.4E-02	0.9	908	3	3	1,133	1.5E-03	1.1E+00
1,2-Dichloroethane	5.6E-04	4.0E-02	9.8E-04	9.9E-06	1.0E-01	0.9	908	3	3	1,133	1.2E-03	9.0E-01
1,1-Dichloroethene	5.7E-03	1.1E+00	2.6E-02	1.0E-05	9.0E-02	0.9	908	3	3	1,133	1.2E-02	9.3E+00
cis-1,2-Dichloroethene	1.4E+01	1.7E-01	4.1E-03	1.1E-05	7.4E-02	0.9	908	3	3	1,133	3.1E+01	2.3E+04
trans-1,2-Dichloroethene	6.1E-02	3.9E-01	9.4E-03	1.2E-05	7.1E-02	0.9	908	3	3	1,133	1.3E-01	9.9E+01
Methyl tert-butyl ether	1.3E-02	2.4E-02	5.9E-04	8.6E-06	7.5E-02	0.9	908	3	3	1,133	2.7E-02	2.0E+01
Methylene chloride	5.0E-04	9.0E-02	2.2E-03	1.2E-05	1.0E-01	0.9	908	3	3	1,133	1.1E-03	8.2E-01
Tetrachloroethene	3.6E-02	7.5E-01	1.8E-02	8.2E-06	7.2E-02	0.9	908	3	3	1,133	7.8E-02	5.8E+01
1,2,3-Trichlorobenzene	8.5E-03	5.1E-02	1.2E-03	8.4E-06	4.0E-02	0.9	908	3	3	1,133	1.8E-02	1.4E+01
1,2,4-Trichlorobenzene	5.8E-02	5.8E-02	1.4E-03	8.2E-06	3.0E-02	0.9	908	3	3	1,133	1.3E-01	9.5E+01
1,1,2-Trichloroethane	3.9E-03	3.7E-02	9.1E-04	8.8E-06	7.8E-02	0.9	908	3	3	1,133	8.4E-03	6.3E+00
Trichloroethene	7.0E+00	4.2E-01	1.0E-02	9.1E-06	7.9E-02	0.9	908	3	3	1,133	1.5E+01	1.1E+04
Vinyl chloride	5.3E-02	1.1E+00	2.7E-02	1.2E-06	1.1E-01	0.9	908	3	3	1,133	1.2E-01	8.6E+01
Naphthalene	3.4E-04	2.0E-02	4.8E-04	7.5E-06	5.9E-02	0.9	908	3	3	1,133	7.4E-04	5.5E-01

Note: Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

TABLE E-2
VOLATILE COPC EMISSION FLUX FROM SHALLOW ONSITE GROUNDWATER - CONSTRUCTION/UTILITY WORKER
CORNELL DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Objective: Determination of outdoor volatile chemical concentrations above a 1.5 m-wide x 5.0 m-long x 3.0 m-deep excavated trench, assuming shallow groundwater infiltrates and pools in the bottom of the excavation.

Chemical of Potential Concern	Groundwater Concentration $C_{i,GW}$ (mg/L)	Groundwater Concentration C_{Li} (g/cm^3)	Henry's Law Constant H (atm-m^3/mole)	Molecular Weight MW_i (g/mol)	Liquid-Phase Mass Transfer Coefficient $k_{i,L}$ (cm/s)	Gas-Phase Mass Transfer Coefficient $k_{i,G}$ (cm/s)	Overall mass Transfer Coefficient K_i (cm/s)	Groundwater Emission Flux F_i (g/s-m^2)	Outdoor Air Concentration $C_{OUTDOOR, GROUNDWATER}$ (mg/m^3)
Benzene	3.0E-03	3.0E-09	5.6E-03	78	1.2E-03	4.9E-01	1.2E-03	3.6E-08	4.7E-06
Chlorobenzene	1.7E-02	1.7E-08	3.7E-03	154	8.7E-04	3.9E-01	8.6E-04	1.5E-07	1.9E-05
Chloroform	2.8E-03	2.8E-09	3.7E-03	119	9.9E-04	4.2E-01	9.7E-04	2.8E-08	3.6E-06
1,2-Dibromo-3-chloropropane	7.7E-05	7.7E-11	1.5E-04	236	7.0E-04	3.4E-01	5.3E-04	4.1E-10	5.3E-08
Dibromochloromethane	5.5E-04	5.5E-10	7.8E-04	208	7.5E-04	3.5E-01	7.0E-04	3.8E-09	5.0E-07
1,2-Dichlorobenzene	7.2E-03	7.2E-09	1.9E-03	147	8.9E-04	3.9E-01	8.7E-04	6.2E-08	8.1E-06
1,3-Dichlorobenzene	1.4E-02	1.4E-08	2.6E-03	147	8.9E-04	3.9E-01	8.7E-04	1.2E-07	1.6E-05
1,4-Dichlorobenzene	1.9E-02	1.9E-08	2.4E-03	147	8.9E-04	3.9E-01	8.7E-04	1.7E-07	2.2E-05
1,1-Dichloroethane	2.9E-03	2.9E-09	5.6E-03	99	1.1E-03	4.5E-01	1.1E-03	3.1E-08	4.1E-06
1,2-Dichloroethane	4.6E-03	4.6E-09	9.8E-04	99	1.1E-03	4.5E-01	1.0E-03	4.7E-08	6.1E-06
1,1-Dichloroethene	6.8E-02	6.8E-08	2.6E-02	97	1.1E-03	4.5E-01	1.1E-03	7.4E-07	9.7E-05
cis-1,2-Dichloroethene	1.4E+02	1.4E-04	4.1E-03	97	1.1E-03	4.5E-01	1.1E-03	1.5E-03	2.0E-01
trans-1,2-Dichloroethene	5.8E-01	5.8E-07	9.4E-03	97	1.1E-03	4.5E-01	1.1E-03	6.3E-06	8.2E-04
Ethylbenzene	1.1E-02	1.1E-08	7.9E-03	106	1.0E-03	4.4E-01	1.0E-03	1.1E-07	1.5E-05
Methylcyclohexane	5.9E-03	5.9E-09	4.3E+00	98	1.1E-03	4.5E-01	1.1E-03	6.4E-08	8.3E-06
Methylene chloride	7.0E-03	7.0E-09	2.2E-03	85	1.2E-03	4.7E-01	1.1E-03	8.0E-08	1.0E-05
Tetrachloroethene	5.4E-01	5.4E-07	1.8E-02	166	8.4E-04	3.8E-01	8.4E-04	4.5E-06	5.8E-04
1,2,3-Trichlorobenzene	7.4E-02	7.4E-08	1.2E-03	181	8.0E-04	3.7E-01	7.7E-04	5.7E-07	7.4E-05
1,2,4-Trichlorobenzene	1.8E-01	1.8E-07	1.4E-03	181	8.0E-04	3.7E-01	7.7E-04	1.4E-06	1.8E-04
1,1,2-Trichloroethane	1.4E-02	1.4E-08	9.1E-04	133	9.4E-04	4.1E-01	8.8E-04	1.2E-07	1.6E-05
Trichloroethene	2.3E+01	2.3E-05	1.0E-02	131	9.4E-04	4.1E-01	9.4E-04	2.2E-04	2.8E-02
o-Xylene	3.8E-02	3.8E-08	5.2E-03	106	1.0E-03	4.4E-01	1.0E-03	3.9E-07	5.1E-05
Vinyl chloride	1.6E-01	1.6E-07	2.7E-02	63	1.4E-03	5.2E-01	1.4E-03	2.2E-06	2.8E-04
Naphthalene	2.0E-03	2.0E-09	4.8E-04	128	9.5E-04	4.1E-01	8.6E-04	1.7E-08	2.2E-06
Phenanthrene	5.2E-04	5.2E-10	4.2E-05	178	8.1E-04	3.7E-01	3.7E-04	1.9E-09	2.5E-07

Note

Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

Parameter	Value	Source
(1) Maximum 1-hour unitized impact (g/m^3 per g/m^{2}s) =	1.30E-01	Predicted for urban land use
(2) Molecular weight of oxygen (MW_{O2}, g/mol) =	32	Default
(3) System temperature (T_S, K) =	284	Default
(4) Liquid-phase mass transfer coefficient of oxygen at 25^{o}C (k_L,O_2, cm/sec) =	0.002	Default
(5) Molecular weight of water (MW_{H2O}, g/mol) =	18	Default
(6) Gas-phase mass transfer coefficient of water vapor at 25^{o}C (k_G, H_2O, cm/sec) =	0.833	Default
(7) Ideal gas constant (R, atm-m^3/mole-K) =	8.20E-05	Default

TABLE E-3
VOLATILE COPC EMISSION FLUX FROM SHALLOW OFFSITE GROUNDWATER, SOUTH OF BOUND BROOK - CONSTRUCTION/UTILITY WORKER
CORNELL DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Objective: Determination of outdoor volatile chemical concentrations above a 1.5 m-wide x 5.0 m-long x 3.0 m-deep excavated trench, assuming shallow groundwater infiltrates and pools in the bottom of the excavation.

Chemical of Potential Concern	Groundwater Concentration $C_{i,GW}$ (mg/L)	Groundwater Concentration C_{Li} (g/cm^3)	Henry's Law Constant H (atm-m^3/mole)	Molecular Weight MW_i (g/mol)	Liquid-Phase Mass Transfer Coefficient $k_{i,L}$ (cm/s)	Gas-Phase Mass Transfer Coefficient $k_{i,G}$ (cm/s)	Overall mass Transfer Coefficient K_i (cm/s)	Groundwater Emission Flux F_i (g/s-m^2)	Outdoor Air Concentration $C_{OUTDOOR,\ GROUNDWATER}$ (mg/m^3)
Benzene	5.0E-04	5.0E-10	5.6E-03	78	1.2E-03	4.9E-01	1.2E-03	6.0E-09	7.9E-07
Chloroform	1.1E-03	1.1E-09	3.7E-03	119	9.9E-04	4.2E-01	9.7E-04	1.1E-08	1.4E-06
Dibromochloromethane	5.1E-04	5.1E-10	7.8E-04	208	7.5E-04	3.5E-01	7.0E-04	3.6E-09	4.7E-07
cis-1,2-Dichloroethene	1.7E-02	1.7E-08	4.1E-03	97	1.1E-03	4.5E-01	1.1E-03	1.8E-07	2.4E-05
Methyl tert-butyl ether	1.9E-01	1.9E-07	5.9E-04	78	1.2E-03	4.9E-01	1.1E-03	2.1E-06	2.7E-04
Tetrachloroethene	1.9E-03	1.9E-09	1.8E-02	166	8.4E-04	3.8E-01	8.4E-04	1.6E-08	2.1E-06
Trichloroethene	1.1E+00	1.1E-06	1.0E-02	131	9.4E-04	4.1E-01	9.4E-04	1.1E-05	1.4E-03
Naphthalene	1.3E-04	1.3E-10	4.8E-04	128	9.5E-04	4.1E-01	8.6E-04	1.1E-09	1.4E-07

Note
Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

Parameter	Value	Source
(1) Maximum 1-hour unitized impact (g/m^3 per g/m^{2}s) =	1.30E-01	Predicted for urban land use
(2) Molecular weight of oxygen (MW_{O2}, g/mol) =	32	Default
(3) System temperature (T_S, K) =	284	Default
(4) Liquid-phase mass transfer coefficient of oxygen at 25^{o}C (k_L,O_2, cm/sec) =	0.002	Default
(5) Molecular weight of water (MW_{H2O}, g/mol) =	18	Default
(6) Gas-phase mass transfer coefficient of water vapor at 25^{o}C (k_G, H_2O, cm/sec) =	0.833	Default
(7) Ideal gas constant (R, atm-m^3/mole-K) =	8.20E-05	Default

TABLE E-4
VOLATILE COPC EMISSION FLUX FROM SHALLOW OFFSITE GROUNDWATER, NORTH OF BOUND BROOK - CONSTRUCTION/UTILITY WORKER
CORNELL DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Objective: Determination of outdoor volatile chemical concentrations above a 1.5 m-wide x 5.0 m-long x 3.0 m-deep excavated trench, assuming shallow groundwater infiltrates and pools in the bottom of the excavation.

Chemical of Potential Concern	Groundwater Concentration $C_{i,GW}$ (mg/L)	Groundwater Concentration C_{Li} (g/cm^3)	Henry's Law Constant H ($atm\text{-}m^3/mole$)	Molecular Weight MW_i (g/mol)	Liquid-Phase Mass Transfer Coefficient $k_{i,L}$ (cm/s)	Gas-Phase Mass Transfer Coefficient $k_{i,G}$ (cm/s)	Overall mass Transfer Coefficient K_i (cm/s)	Groundwater Emission Flux F_i ($g/s\text{-}m^2$)	Outdoor Air Concentration $C_{OUTDOOR, GROUNDWATER}$ (mg/m^3)
Benzene	1.2E-03	1.2E-09	5.6E-03	78	1.2E-03	4.9E-01	1.2E-03	1.5E-08	1.9E-06
Bromodichloromethane	3.5E-04	3.5E-10	1.6E-03	164	8.4E-04	3.8E-01	8.2E-04	2.9E-09	3.7E-07
Chloroform	1.4E-03	1.4E-09	3.7E-03	119	9.9E-04	4.2E-01	9.7E-04	1.4E-08	1.8E-06
cis-1,2-Dichloroethene	4.9E-02	4.9E-08	4.1E-03	97	1.1E-03	4.5E-01	1.1E-03	5.3E-07	6.8E-05
Tetrachloroethene	3.8E-04	3.8E-10	1.8E-02	166	8.4E-04	3.8E-01	8.4E-04	3.1E-09	4.1E-07
Trichloroethene	2.4E-01	2.4E-07	1.0E-02	131	9.4E-04	4.1E-01	9.4E-04	2.2E-06	2.9E-04
Vinyl chloride	3.6E-04	3.6E-10	2.7E-02	63	1.4E-03	5.2E-01	1.4E-03	4.9E-09	6.4E-07
Naphthalene	1.1E-04	1.1E-10	4.8E-04	128	9.5E-04	4.1E-01	8.6E-04	9.7E-10	1.3E-07

Note
Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

Parameter	Value	Source
(1) Maximum 1-hour unitized impact (g/m^3 per g/m^2s) =	1.30E-01	Predicted for urban land use
(2) Molecular weight of oxygen (MW_{O2}, g/mol) =	32	Default
(3) System temperature (T_S, K) =	284	Default
(4) Liquid-phase mass transfer coefficient of oxygen at 25°C (k_L,O_2, cm/sec) =	0.002	Default
(5) Molecular weight of water (MW_{H2O}, g/mol) =	18	Default
(6) Gas-phase mass transfer coefficient of water vapor at 25°C (k_G, H_2O, cm/sec) =	0.833	Default
(7) Ideal gas constant (R, $atm\text{-}m^3/mole\text{-}K$) =	8.20E-05	Default

TABLE E-5 (RME)
INDOOR SHOWER MODEL SCENARIO - ADULT RESIDENT
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical	Concentration in Water C_w (mg/L)	Henry's Law Constant H (unitless)	Henry's Law Constant H (atm-m^3/mol)	Diffusion Coefficient in Water D_w (m^2/sec)	Diffusion Coefficient in Air D_a (m^2/sec)	Fraction Volatilized f (unitless)	Flow Rate of Shower F_w (L/hr)	Time of Shower t_1 (hours)	Time after Shower t_2 (hours)	Bathroom Volume V_a (m^3)	Max Concentration in Bathroom Air $C_{a,max}$ (mg/m^3)	Concentration in Air C_a (µg/m^3)
Benzene	7.2E-04	2.3E-01	5.6E-03	9.8E-06	8.8E-02	0.9	500	0.25	0.33	16	5.1E-03	4.0E+00
Bromodichloromethane	4.1E-04	6.6E-02	1.6E-03	1.1E-05	3.0E-02	0.9	500	0.25	0.33	16	2.9E-03	2.2E+00
Chlorobenzene	3.7E-03	1.5E-01	3.7E-03	8.7E-06	7.3E-02	0.9	500	0.25	0.33	16	2.6E-02	2.0E+01
Chloroform	2.8E-03	1.5E-01	3.7E-03	1.0E-05	1.0E-01	0.9	500	0.25	0.33	16	2.0E-02	1.5E+01
Dibromochloromethane	3.4E-04	3.2E-02	7.8E-04	1.1E-05	2.0E-02	0.9	500	0.25	0.33	16	2.4E-03	1.9E+00
1,2-Dichlorobenzene	2.1E-03	7.8E-02	1.9E-03	7.9E-06	6.9E-02	0.9	500	0.25	0.33	16	1.5E-02	1.2E+01
1,3-Dichlorobenzene	5.2E-03	1.1E-01	2.6E-03	7.9E-06	6.9E-02	0.9	500	0.25	0.33	16	3.7E-02	2.9E+01
1,4-Dichlorobenzene	5.0E-03	1.0E-01	2.4E-03	7.9E-06	6.9E-02	0.9	500	0.25	0.33	16	3.5E-02	2.8E+01
1,1-Dichloroethane	7.0E-04	2.3E-01	5.6E-03	1.1E-05	7.4E-02	0.9	500	0.25	0.33	16	4.9E-03	3.9E+00
1,2-Dichloroethane	5.6E-04	4.0E-02	9.8E-04	9.9E-06	1.0E-01	0.9	500	0.25	0.33	16	3.9E-03	3.1E+00
1,1-Dichloroethene	5.7E-03	1.1E+00	2.6E-02	1.0E-05	9.0E-02	0.9	500	0.25	0.33	16	4.0E-02	3.2E+01
cis-1,2-Dichloroethene	1.4E+01	1.7E-01	4.1E-03	1.1E-05	7.4E-02	0.9	500	0.25	0.33	16	9.9E+01	7.8E+04
trans-1,2-Dichloroethene	6.1E-02	3.9E-01	9.4E-03	1.2E-05	7.1E-02	0.9	500	0.25	0.33	16	4.3E-01	3.4E+02
Methyl tert-butyl ether	1.3E-02	2.4E-02	5.9E-04	8.6E-06	7.5E-02	0.9	500	0.25	0.33	16	8.8E-02	6.9E+01
Methylene chloride	5.0E-04	9.0E-02	2.2E-03	1.2E-05	1.0E-01	0.9	500	0.25	0.33	16	3.5E-03	2.8E+00
Tetrachloroethene	3.6E-02	7.5E-01	1.8E-02	8.2E-06	7.2E-02	0.9	500	0.25	0.33	16	2.5E-01	2.0E+02
1,2,3-Trichlorobenzene	8.5E-03	5.1E-02	1.2E-03	8.4E-06	4.0E-02	0.9	500	0.25	0.33	16	5.9E-02	4.7E+01
1,2,4-Trichlorobenzene	5.8E-02	5.8E-02	1.4E-03	8.2E-06	3.0E-02	0.9	500	0.25	0.33	16	4.1E-01	3.2E+02
1,1,2-Trichloroethane	3.9E-03	3.7E-02	9.1E-04	8.8E-06	7.8E-02	0.9	500	0.25	0.33	16	2.7E-02	2.2E+01
Trichloroethene	7.0E+00	4.2E-01	1.0E-02	9.1E-06	7.9E-02	0.9	500	0.25	0.33	16	5.0E+01	3.9E+04
Vinyl chloride	5.3E-02	1.1E+00	2.7E-02	1.2E-06	1.1E-01	0.9	500	0.25	0.33	16	3.7E-01	2.9E+02
Naphthalene	3.4E-04	2.0E-02	4.8E-04	7.5E-06	5.9E-02	0.9	500	0.25	0.33	16	2.4E-03	1.9E+00

Note: Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

TABLE E-5 (CT)
INDOOR SHOWER MODEL SCENARIO - ADULT RESIDENT
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical	Concentration in Water C_w (mg/L)	Henry's Law Constant H (unitless)	Henry's Law Constant H (atm-m^3/mol)	Diffusion Coefficient in Water D_w (m^2/sec)	Diffusion Coefficient in Air D_a (m^2/sec)	Fraction Volatilized f (unitless)	Flow Rate of Shower F_w (L/hr)	Time of Shower t_1 (hours)	Time after Shower t_2 (hours)	Bathroom Volume V_a (m^3)	Max Concentration in Bathroom Air $C_{a,max}$ (mg/m^3)	Concentration in Air C_a (µg/m^3)
Benzene	7.2E-04	2.3E-01	5.6E-03	9.8E-06	8.8E-02	0.9	500	0.11	0.14	16	2.2E-03	1.7E+00
Bromodichloromethane	4.1E-04	6.6E-02	1.6E-03	1.1E-05	3.0E-02	0.9	500	0.11	0.14	16	1.3E-03	9.8E-01
Chlorobenzene	3.7E-03	1.5E-01	3.7E-03	8.7E-06	7.3E-02	0.9	500	0.11	0.14	16	1.1E-02	8.9E+00
Chloroform	2.8E-03	1.5E-01	3.7E-03	1.0E-05	1.0E-01	0.9	500	0.11	0.14	16	8.6E-03	6.7E+00
Dibromochloromethane	3.4E-04	3.2E-02	7.8E-04	1.1E-05	2.0E-02	0.9	500	0.11	0.14	16	1.1E-03	8.3E-01
1,2-Dichlorobenzene	2.1E-03	7.8E-02	1.9E-03	7.9E-06	6.9E-02	0.9	500	0.11	0.14	16	6.6E-03	5.2E+00
1,3-Dichlorobenzene	5.2E-03	1.1E-01	2.6E-03	7.9E-06	6.9E-02	0.9	500	0.11	0.14	16	1.6E-02	1.3E+01
1,4-Dichlorobenzene	5.0E-03	1.0E-01	2.4E-03	7.9E-06	6.9E-02	0.9	500	0.11	0.14	16	1.5E-02	1.2E+01
1,1-Dichloroethane	7.0E-04	2.3E-01	5.6E-03	1.1E-05	7.4E-02	0.9	500	0.11	0.14	16	2.2E-03	1.7E+00
1,2-Dichloroethane	5.6E-04	4.0E-02	9.8E-04	9.9E-06	1.0E-01	0.9	500	0.11	0.14	16	1.7E-03	1.3E+00
1,1-Dichloroethene	5.7E-03	1.1E+00	2.6E-02	1.0E-05	9.0E-02	0.9	500	0.11	0.14	16	1.8E-02	1.4E+01
cis-1,2-Dichloroethene	1.4E+01	1.7E-01	4.1E-03	1.1E-05	7.4E-02	0.9	500	0.11	0.14	16	4.4E+01	3.4E+04
trans-1,2-Dichloroethene	6.1E-02	3.9E-01	9.4E-03	1.2E-05	7.1E-02	0.9	500	0.11	0.14	16	1.9E-01	1.5E+02
Methyl tert-butyl ether	1.3E-02	2.4E-02	5.9E-04	8.6E-06	7.5E-02	0.9	500	0.11	0.14	16	3.9E-02	3.0E+01
Methylene chloride	5.0E-04	9.0E-02	2.2E-03	1.2E-05	1.0E-01	0.9	500	0.11	0.14	16	1.6E-03	1.2E+00
Tetrachloroethene	3.6E-02	7.5E-01	1.8E-02	8.2E-06	7.2E-02	0.9	500	0.11	0.14	16	1.1E-01	8.7E+01
1,2,3-Trichlorobenzene	8.5E-03	5.1E-02	1.2E-03	8.4E-06	4.0E-02	0.9	500	0.11	0.14	16	2.6E-02	2.0E+01
1,2,4-Trichlorobenzene	5.8E-02	5.8E-02	1.4E-03	8.2E-06	3.0E-02	0.9	500	0.11	0.14	16	1.8E-01	1.4E+02
1,1,2-Trichloroethane	3.9E-03	3.7E-02	9.1E-04	8.8E-06	7.8E-02	0.9	500	0.11	0.14	16	1.2E-02	9.4E+00
Trichloroethene	7.0E+00	4.2E-01	1.0E-02	9.1E-06	7.9E-02	0.9	500	0.11	0.14	16	2.2E+01	1.7E+04
Vinyl chloride	5.3E-02	1.1E+00	2.7E-02	1.2E-06	1.1E-01	0.9	500	0.11	0.14	16	1.6E-01	1.3E+02
Naphthalene	3.4E-04	2.0E-02	4.8E-04	7.5E-06	5.9E-02	0.9	500	0.11	0.14	16	1.1E-03	8.2E-01

Note: Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

TABLE E-6 (RME)
INDOOR SHOWER MODEL SCENARIO - CHILD RESIDENT
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical	Concentration in Water C_w (mg/L)	Henry's Law Constant H (unitless)	Henry's Law Constant H (atm-m^3/mol)	Diffusion Coefficient in Water D_w (m^2/sec)	Diffusion Coefficient in Air D_a (m^2/sec)	Fraction Volatilized f (unitless)	Flow Rate of Shower F_w (L/hr)	Time of Shower t_1 (hours)	Time after Shower t_2 (hours)	Bathroom Volume V_a (m^3)	Max Concentration in Bathroom Air $C_{a,max}$ (mg/m^3)	Concentration in Air C_a (µg/m^3)
Benzene	7.2E-04	2.3E-01	5.6E-03	9.8E-06	8.8E-02	0.9	500	0.45	0.55	16	9.1E-03	7.1E+00
Bromodichloromethane	4.1E-04	6.6E-02	1.6E-03	1.1E-05	3.0E-02	0.9	500	0.45	0.55	16	5.1E-03	4.0E+00
Chlorobenzene	3.7E-03	1.5E-01	3.7E-03	8.7E-06	7.3E-02	0.9	500	0.45	0.55	16	4.7E-02	3.6E+01
Chloroform	2.8E-03	1.5E-01	3.7E-03	1.0E-05	1.0E-01	0.9	500	0.45	0.55	16	3.5E-02	2.7E+01
Dibromochloromethane	3.4E-04	3.2E-02	7.8E-04	1.1E-05	2.0E-02	0.9	500	0.45	0.55	16	4.3E-03	3.4E+00
1,2-Dichlorobenzene	2.1E-03	7.8E-02	1.9E-03	7.9E-06	6.9E-02	0.9	500	0.45	0.55	16	2.7E-02	2.1E+01
1,3-Dichlorobenzene	5.2E-03	1.1E-01	2.6E-03	7.9E-06	6.9E-02	0.9	500	0.45	0.55	16	6.6E-02	5.1E+01
1,4-Dichlorobenzene	5.0E-03	1.0E-01	2.4E-03	7.9E-06	6.9E-02	0.9	500	0.45	0.55	16	6.3E-02	4.9E+01
1,1-Dichloroethane	7.0E-04	2.3E-01	5.6E-03	1.1E-05	7.4E-02	0.9	500	0.45	0.55	16	8.8E-03	6.9E+00
1,2-Dichloroethane	5.6E-04	4.0E-02	9.8E-04	9.9E-06	1.0E-01	0.9	500	0.45	0.55	16	7.0E-03	5.4E+00
1,1-Dichloroethene	5.7E-03	1.1E+00	2.6E-02	1.0E-05	9.0E-02	0.9	500	0.45	0.55	16	7.2E-02	5.6E+01
cis-1,2-Dichloroethene	1.4E+01	1.7E-01	4.1E-03	1.1E-05	7.4E-02	0.9	500	0.45	0.55	16	1.8E+02	1.4E+05
trans-1,2-Dichloroethene	6.1E-02	3.9E-01	9.4E-03	1.2E-05	7.1E-02	0.9	500	0.45	0.55	16	7.7E-01	6.0E+02
Methyl tert-butyl ether	1.3E-02	2.4E-02	5.9E-04	8.6E-06	7.5E-02	0.9	500	0.45	0.55	16	1.6E-01	1.2E+02
Methylene chloride	5.0E-04	9.0E-02	2.2E-03	1.2E-05	1.0E-01	0.9	500	0.45	0.55	16	6.4E-03	4.9E+00
Tetrachloroethene	3.6E-02	7.5E-01	1.8E-02	8.2E-06	7.2E-02	0.9	500	0.45	0.55	16	4.6E-01	3.5E+02
1,2,3-Trichlorobenzene	8.5E-03	5.1E-02	1.2E-03	8.4E-06	4.0E-02	0.9	500	0.45	0.55	16	1.1E-01	8.3E+01
1,2,4-Trichlorobenzene	5.8E-02	5.8E-02	1.4E-03	8.2E-06	3.0E-02	0.9	500	0.45	0.55	16	7.4E-01	5.7E+02
1,1,2-Trichloroethane	3.9E-03	3.7E-02	9.1E-04	8.8E-06	7.8E-02	0.9	500	0.45	0.55	16	4.9E-02	3.8E+01
Trichloroethene	7.0E+00	4.2E-01	1.0E-02	9.1E-06	7.9E-02	0.9	500	0.45	0.55	16	8.9E+01	6.9E+04
Vinyl chloride	5.3E-02	1.1E+00	2.7E-02	1.2E-06	1.1E-01	0.9	500	0.45	0.55	16	6.7E-01	5.2E+02
Naphthalene	3.4E-04	2.0E-02	4.8E-04	7.5E-06	5.9E-02	0.9	500	0.45	0.55	16	4.3E-03	3.3E+00

Note: Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

TABLE E-6 (CT)
INDOOR SHOWER MODEL SCENARIO - CHILD RESIDENT
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
SOUTH PLAINFIELD, NEW JERSEY

Chemical	Concentration in Water C_w (mg/L)	Henry's Law Constant H (unitless)	Henry's Law Constant H (atm-m^3/mol)	Diffusion Coefficient in Water D_w (m^2/sec)	Diffusion Coefficient in Air D_a (m^2/sec)	Fraction Volatilized f (unitless)	Flow Rate of Shower F_w (L/hr)	Time of Shower t_1 (hours)	Time after Shower t_2 (hours)	Bathroom Volume V_a (m^3)	Max Concentration in Bathroom Air $C_{a,max}$ (mg/m^3)	Concentration in Air C_a (µg/m^3)
Benzene	7.2E-04	2.3E-01	5.6E-03	9.8E-06	8.8E-02	0.9	500	0.15	0.18	16	3.0E-03	2.4E+00
Bromodichloromethane	4.1E-04	6.6E-02	1.6E-03	1.1E-05	3.0E-02	0.9	500	0.15	0.18	16	1.7E-03	1.3E+00
Chlorobenzene	3.7E-03	1.5E-01	3.7E-03	8.7E-06	7.3E-02	0.9	500	0.15	0.18	16	1.6E-02	1.2E+01
Chloroform	2.8E-03	1.5E-01	3.7E-03	1.0E-05	1.0E-01	0.9	500	0.15	0.18	16	1.2E-02	9.1E+00
Dibromochloromethane	3.4E-04	3.2E-02	7.8E-04	1.1E-05	2.0E-02	0.9	500	0.15	0.18	16	1.4E-03	1.1E+00
1,2-Dichlorobenzene	2.1E-03	7.8E-02	1.9E-03	7.9E-06	6.9E-02	0.9	500	0.15	0.18	16	9.1E-03	7.0E+00
1,3-Dichlorobenzene	5.2E-03	1.1E-01	2.6E-03	7.9E-06	6.9E-02	0.9	500	0.15	0.18	16	2.2E-02	1.7E+01
1,4-Dichlorobenzene	5.0E-03	1.0E-01	2.4E-03	7.9E-06	6.9E-02	0.9	500	0.15	0.18	16	2.1E-02	1.6E+01
1,1-Dichloroethane	7.0E-04	2.3E-01	5.6E-03	1.1E-05	7.4E-02	0.9	500	0.15	0.18	16	2.9E-03	2.3E+00
1,2-Dichloroethane	5.6E-04	4.0E-02	9.8E-04	9.9E-06	1.0E-01	0.9	500	0.15	0.18	16	2.3E-03	1.8E+00
1,1-Dichloroethene	5.7E-03	1.1E+00	2.6E-02	1.0E-05	9.0E-02	0.9	500	0.15	0.18	16	2.4E-02	1.9E+01
cis-1,2-Dichloroethene	1.4E+01	1.7E-01	4.1E-03	1.1E-05	7.4E-02	0.9	500	0.15	0.18	16	6.0E+01	4.6E+04
trans-1,2-Dichloroethene	6.1E-02	3.9E-01	9.4E-03	1.2E-05	7.1E-02	0.9	500	0.15	0.18	16	2.6E-01	2.0E+02
Methyl tert-butyl ether	1.3E-02	2.4E-02	5.9E-04	8.6E-06	7.5E-02	0.9	500	0.15	0.18	16	5.3E-02	4.1E+01
Methylene chloride	5.0E-04	9.0E-02	2.2E-03	1.2E-05	1.0E-01	0.9	500	0.15	0.18	16	2.1E-03	1.6E+00
Tetrachloroethene	3.6E-02	7.5E-01	1.8E-02	8.2E-06	7.2E-02	0.9	500	0.15	0.18	16	1.5E-01	1.2E+02
1,2,3-Trichlorobenzene	8.5E-03	5.1E-02	1.2E-03	8.4E-06	4.0E-02	0.9	500	0.15	0.18	16	3.6E-02	2.8E+01
1,2,4-Trichlorobenzene	5.8E-02	5.8E-02	1.4E-03	8.2E-06	3.0E-02	0.9	500	0.15	0.18	16	2.5E-01	1.9E+02
1,1,2-Trichloroethane	3.9E-03	3.7E-02	9.1E-04	8.8E-06	7.8E-02	0.9	500	0.15	0.18	16	1.6E-02	1.3E+01
Trichloroethene	7.0E+00	4.2E-01	1.0E-02	9.1E-06	7.9E-02	0.9	500	0.15	0.18	16	3.0E+01	2.3E+04
Vinyl chloride	5.3E-02	1.1E+00	2.7E-02	1.2E-06	1.1E-01	0.9	500	0.15	0.18	16	2.2E-01	1.7E+02
Naphthalene	3.4E-04	2.0E-02	4.8E-04	7.5E-06	5.9E-02	0.9	500	0.15	0.18	16	1.4E-03	1.1E+00

Note: Sources of chemical-specific properties (i.e., Henry's Law Constant, etc.) are USEPA (1996b) and USDOE (2011).

Dermal Exposure Assessment Worksheets

Table E-7
Dermal Worksheet
Intermediate Variables for Calculating DA_{event}

Scenario Timeframe:	Current/Future
Receptor Population:	Commercial/Industrial Worker
Exposure Medium:	Groundwater, Entire Aquifer

Chemical of Potential Concern	FA	Kp		t-event		Tau (event)		t*		B
	Value	Value	Units	Value	Units	Value	Units	Value	Units	Value
Benzene	1	1.5E-02	cm/hr	8	hr/event	0.29	hr/event	0.70	hr	0.051
Bromodichloromethane	1	4.6E-03	cm/hr	8	hr/event	0.88	hr/event	2.12	hr	0.023
Chlorobenzene	0.7	2.8E-02	cm/hr	8	hr/event	0.46	hr/event	1.09	hr	0.115
Chloroform	1	6.8E-03	cm/hr	8	hr/event	0.50	hr/event	1.19	hr	0.029
Dibromochloromethane	1	3.2E-03	cm/hr	8	hr/event	1.57	hr/event	3.77	hr	0.018
1,2-Dichlorobenzene	1	4.1E-02	cm/hr	8	hr/event	0.71	hr/event	1.71	hr	0.193
1,3-Dichlorobenzene	1	5.8E-02	cm/hr	8	hr/event	0.71	hr/event	1.71	hr	0.270
1,4-Dichlorobenzene	1	4.2E-02	cm/hr	8	hr/event	0.71	hr/event	1.71	hr	0.196
1,1-Dichloroethane	1	6.7E-03	cm/hr	8	hr/event	0.38	hr/event	0.92	hr	0.026
1,2-Dichloroethane	1	4.2E-03	cm/hr	8	hr/event	0.38	hr/event	0.92	hr	0.016
1,1-Dichloroethene	1	1.2E-02	cm/hr	8	hr/event	0.37	hr/event	0.89	hr	0.044
cis-1,2-Dichloroethene	1	7.7E-03	cm/hr	8	hr/event	0.37	hr/event	0.89	hr	0.029
trans-1,2-Dichloroethene	1	7.7E-03	cm/hr	8	hr/event	0.37	hr/event	0.89	hr	0.029
Methyl tert-butyl ether	1	2.1E-03	cm/hr	8	hr/event	0.33	hr/event	0.80	hr	0.008
Methylene chloride	1	3.5E-03	cm/hr	8	hr/event	0.32	hr/event	0.76	hr	0.013
Tetrachloroethene	1	3.3E-02	cm/hr	8	hr/event	0.91	hr/event	2.18	hr	0.166
1,2,3-Trichlorobenzene	1	7.4E-02	cm/hr	8	hr/event	1.10	hr/event	2.65	hr	0.384
1,2,4-Trichlorobenzene	1	6.6E-02	cm/hr	8	hr/event	1.11	hr/event	2.66	hr	0.343
1,1,2-Trichloroethane	1	6.4E-03	cm/hr	8	hr/event	0.60	hr/event	1.43	hr	0.029
Trichloroethene	1	1.2E-02	cm/hr	8	hr/event	0.58	hr/event	1.39	hr	0.051
Vinyl chloride	1	5.6E-03	cm/hr	8	hr/event	0.24	hr/event	0.57	hr	0.017
bis(2-Ethylhexyl)phthalate	0.8	2.5E-02	cm/hr	8	hr/event	16.64	hr/event	39.93	hr	0.190
Dibenzo(a,h)anthracene	0.6	1.5E+00	cm/hr	8	hr/event	3.88	hr/event	17.57	hr	9.677
Indeno(1,2,3-cd)pyrene	0.6	1.0E+00	cm/hr	8	hr/event	3.78	hr/event	16.83	hr	6.654
Naphthalene	1	4.7E-02	cm/hr	8	hr/event	0.56	hr/event	1.34	hr	0.203
Total PCB Aroclors (as Aroclor 1254)	0.5	7.6E-01	cm/hr	8	hr/event	7.18	hr/event	31.57	hr	5.244
alpha-BHC	0.9	1.2E-02	cm/hr	8	hr/event	4.57	hr/event	10.97	hr	0.080
gamma-Chlordane	0.7	3.8E-02	cm/hr	8	hr/event	21.21	hr/event	50.91	hr	0.294
4,4'-DDD	0.8	1.8E-01	cm/hr	8	hr/event	6.65	hr/event	25.99	hr	1.234
4,4'-DDE	0.8	1.6E-01	cm/hr	8	hr/event	6.48	hr/event	25.08	hr	1.067
4,4'-DDT	0.7	2.7E-01	cm/hr	8	hr/event	10.45	hr/event	42.51	hr	1.948
Heptachlor	0.8	8.6E-03	cm/hr	8	hr/event	13.27	hr/event	31.85	hr	0.064
2,3,7,8-TCDD Toxic Equivalence	0.5	8.1E-01	cm/hr	8	hr/event	6.82	hr/event	30.09	hr	5.573
Aluminum	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Arsenic	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Barium	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Cadmium	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Chromium (Cr VI)	1	2.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Cobalt	1	4.0E-04	cm/hr	8	hr/event	--	hr/event	--	hr	--
Iron	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Manganese	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Vanadium	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--

Notes

FA = Fraction Absorbed Water; default value = 1 (USEPA, 2004)

Kp = Dermal Permeability Coefficient of chemical in water (USEPA, 1996b and USDOE, 2011)

T(event) = Event Duration

Tau = Lag Time

T* = Time to Reach Steady-State

B = Dimensionless Ratio of the Permeability Coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis

Table E-8
Dermal Worksheet
Intermediate Variables for Calculating DA_{event}

Scenario Timeframe:	Current/Future
Receptor Population:	Construction/Utility Worker
Exposure Medium:	Shallow Groundwater

Chemical of Potential Concern	FA	Kp		t-event		tau (event)		t*		B
	Value	Value	Units	Value	Units	Value	Units	Value	Units	Value
Benzene	1	1.5E-02	cm/hr	8	hr/event	0.29	hr/event	0.70	hr	0.051
Bromodichloromethane	1	4.6E-03	cm/hr	8	hr/event	0.88	hr/event	2.12	hr	0.023
Chlorobenzene	0.7	2.8E-02	cm/hr	8	hr/event	0.46	hr/event	1.09	hr	0.115
Chloroform	1	6.8E-03	cm/hr	8	hr/event	0.50	hr/event	1.19	hr	0.029
1,2-Dibromo-3-chloropropane	1	6.9E-03	cm/hr	8	hr/event	2.25	hr/event	5.39	hr	0.041
Dibromochloromethane	1	3.2E-03	cm/hr	8	hr/event	1.57	hr/event	3.77	hr	0.018
1,2-Dichlorobenzene	1	4.1E-02	cm/hr	8	hr/event	0.71	hr/event	1.71	hr	0.193
1,3-Dichlorobenzene	1	5.8E-02	cm/hr	8	hr/event	0.71	hr/event	1.71	hr	0.270
1,4-Dichlorobenzene	1	4.2E-02	cm/hr	8	hr/event	0.71	hr/event	1.71	hr	0.196
1,1-Dichloroethane	1	6.7E-03	cm/hr	8	hr/event	0.38	hr/event	0.92	hr	0.026
1,2-Dichloroethane	1	4.2E-03	cm/hr	8	hr/event	0.38	hr/event	0.92	hr	0.016
1,1-Dichloroethene	1	1.2E-02	cm/hr	8	hr/event	0.37	hr/event	0.89	hr	0.044
cis-1,2-Dichloroethene	1	7.7E-03	cm/hr	8	hr/event	0.37	hr/event	0.89	hr	0.029
trans-1,2-Dichloroethene	1	7.7E-03	cm/hr	8	hr/event	0.37	hr/event	0.89	hr	0.029
Ethylbenzene	1	4.9E-02	cm/hr	8	hr/event	0.42	hr/event	1.01	hr	0.195
Methyl tert-butyl ether	1	2.1E-03	cm/hr	8	hr/event	0.33	hr/event	0.80	hr	0.008
Methylcyclohexane	1	2.1E-03	cm/hr	8	hr/event	0.38	hr/event	0.91	hr	0.421
Methylene chloride	1	3.5E-03	cm/hr	8	hr/event	0.32	hr/event	0.76	hr	0.013
Tetrachloroethene	1	3.3E-02	cm/hr	8	hr/event	0.91	hr/event	2.18	hr	0.166
1,2,3-Trichlorobenzene	1	7.4E-02	cm/hr	8	hr/event	1.10	hr/event	2.65	hr	0.384
1,2,4-Trichlorobenzene	1	6.6E-02	cm/hr	8	hr/event	1.11	hr/event	2.66	hr	0.343
1,1,2-Trichloroethane	1	6.4E-03	cm/hr	8	hr/event	0.60	hr/event	1.43	hr	0.029
Trichloroethene	1	1.2E-02	cm/hr	8	hr/event	0.58	hr/event	1.39	hr	0.051
o-Xylene	1	4.8E-02	cm/hr	8	hr/event	0.42	hr/event	1.01	hr	0.189
Vinyl chloride	1	5.6E-03	cm/hr	8	hr/event	0.24	hr/event	0.57	hr	0.017
Benzo(a)anthracene	1	4.7E-01	cm/hr	8	hr/event	2.03	hr/event	8.53	hr	2.752
Benzo(a)pyrene	1	7.0E-01	cm/hr	8	hr/event	2.69	hr/event	11.67	hr	4.265
Benzo(b)fluoranthene	1	7.0E-01	cm/hr	8	hr/event	2.77	hr/event	12.03	hr	4.289
Benzo(g,h,i)perylene	1	1.1E+00	cm/hr	8	hr/event	3.77	hr/event	16.83	hr	7.207
Benzo(k)fluoranthene	1	6.9E-01	cm/hr	8	hr/event	2.76	hr/event	11.97	hr	4.238
1,1-Biphenyl	1	9.4E-02	cm/hr	8	hr/event	0.78	hr/event	1.87	hr	0.450
Bis(2-ethylhexyl)phthalate	0.8	2.5E-02	cm/hr	8	hr/event	16.64	hr/event	39.93	hr	0.190
Dibenzo(a,h)anthracene	0.6	1.5E+00	cm/hr	8	hr/event	3.88	hr/event	17.57	hr	9.677
Indeno(1,2,3-cd)pyrene	0.6	1.0E+00	cm/hr	8	hr/event	3.78	hr/event	16.83	hr	6.654
Naphthalene	1	4.7E-02	cm/hr	8	hr/event	0.56	hr/event	1.34	hr	0.203
Phenanthrene	1	1.4E-01	cm/hr	8	hr/event	1.06	hr/event	4.11	hr	0.740
Total PCB Aroclors (as Aroclor 1254)	0.5	7.6E-01	cm/hr	8	hr/event	7.18	hr/event	31.57	hr	5.244
alpha-BHC	0.9	1.2E-02	cm/hr	8	hr/event	4.57	hr/event	10.97	hr	0.080
beta-BHC	0.9	1.2E-02	cm/hr	8	hr/event	4.57	hr/event	10.97	hr	0.078
delta-BHC	0.9	2.1E-02	cm/hr	8	hr/event	4.57	hr/event	10.97	hr	0.135
gamma-BHC	0.9	1.1E-02	cm/hr	8	hr/event	4.57	hr/event	10.97	hr	0.071
gamma-Chlordane	0.7	3.8E-02	cm/hr	8	hr/event	21.21	hr/event	50.91	hr	0.294
4,4'-DDD	0.8	1.8E-01	cm/hr	8	hr/event	6.65	hr/event	25.99	hr	1.234
4,4'-DDE	0.8	1.6E-01	cm/hr	8	hr/event	6.48	hr/event	25.08	hr	1.067
4,4'-DDT	0.7	2.7E-01	cm/hr	8	hr/event	10.45	hr/event	42.51	hr	1.948
Dieldrin	0.8	1.2E-02	cm/hr	8	hr/event	14.62	hr/event	35.09	hr	0.092
Endosulfan II	1	2.9E-03	cm/hr	8	hr/event	20.46	hr/event	49.10	hr	0.022
Endosulfan sulfate	1	1.8E-03	cm/hr	8	hr/event	25.16	hr/event	60.38	hr	0.014
Endrin aldehyde	1	1.8E-02	cm/hr	8	hr/event	14.62	hr/event	35.09	hr	0.133
Heptachlor	0.8	8.6E-03	cm/hr	8	hr/event	13.27	hr/event	31.85	hr	0.064
2,3,7,8-TCDD Toxic Equivalence	0.5	8.1E-01	cm/hr	8	hr/event	6.82	hr/event	30.09	hr	5.573
Aluminum	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Antimony	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Arsenic	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Barium	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Cadmium	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Chromium (Cr VI)	1	2.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Cobalt	1	4.0E-04	cm/hr	8	hr/event	--	hr/event	--	hr	--
Iron	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Manganese	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--
Vanadium	1	1.0E-03	cm/hr	8	hr/event	--	hr/event	--	hr	--

Notes

FA = Fraction Absorbed Water; default value = 1 (USEPA, 2004)

Kp = Dermal Permeability Coefficient of chemical in water (USEPA, 1996b and USDOE, 2011)

T(event) = Event Duration

Tau = Lag Time

T* = Time to Reach Steady-State

B = Dimensionless Ratio of the Permeability Coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis

Table E-9
Dermal Worksheet
Intermediate Variables for Calculating DA_{event}

Scenario Timeframe:	Current/Future
Receptor Population:	Resident Adult
Exposure Medium:	Groundwater, Entire Aquifer

Chemical of Potential Concern	FA	Kp		t-event		Tau (event)		t*		B
	Value	Value	Units	Value	Units	Value	Units	Value	Units	Value
Chlorobenzene	0.7	2.8E-02	cm/hr	0.25	hr/event	0.46	hr/event	1.09	hr	0.115
1,2-Dichlorobenzene	1	4.1E-02	cm/hr	0.25	hr/event	0.71	hr/event	1.71	hr	0.193
1,3-Dichlorobenzene	1	5.8E-02	cm/hr	0.25	hr/event	0.71	hr/event	1.71	hr	0.270
1,4-Dichlorobenzene	1	4.2E-02	cm/hr	0.25	hr/event	0.71	hr/event	1.71	hr	0.196
Tetrachloroethene	1	3.3E-02	cm/hr	0.25	hr/event	0.91	hr/event	2.18	hr	0.166
1,2,3-Trichlorobenzene	1	7.4E-02	cm/hr	0.25	hr/event	1.10	hr/event	2.65	hr	0.384
1,2,4-Trichlorobenzene	1	6.6E-02	cm/hr	0.25	hr/event	1.11	hr/event	2.66	hr	0.343
Trichloroethene	1	1.2E-02	cm/hr	0.25	hr/event	0.58	hr/event	1.39	hr	0.051
bis(2-Ethylhexyl)phthalate	0.8	2.5E-02	cm/hr	0.25	hr/event	16.64	hr/event	39.93	hr	0.190
Dibenzo(a,h)anthracene	0.6	1.5E+00	cm/hr	0.25	hr/event	3.88	hr/event	17.57	hr	9.677
Indeno(1,2,3-cd)pyrene	0.6	1.0E+00	cm/hr	0.25	hr/event	3.78	hr/event	16.83	hr	6.654
Naphthalene	1	4.7E-02	cm/hr	0.25	hr/event	0.56	hr/event	1.34	hr	0.203
Total PCB Aroclors (as Aroclor 1254)	0.5	7.6E-01	cm/hr	0.25	hr/event	7.18	hr/event	31.57	hr	5.244
alpha-BHC	0.9	1.2E-02	cm/hr	0.25	hr/event	4.57	hr/event	10.97	hr	0.080
gamma-Chlordane	0.7	3.8E-02	cm/hr	0.25	hr/event	21.21	hr/event	50.91	hr	0.294
4,4'-DDD	0.8	1.8E-01	cm/hr	0.25	hr/event	6.65	hr/event	25.99	hr	1.234
4,4'-DDE	0.8	1.6E-01	cm/hr	0.25	hr/event	6.48	hr/event	25.08	hr	1.067
4,4'-DDT	0.7	2.7E-01	cm/hr	0.25	hr/event	10.45	hr/event	42.51	hr	1.948
Heptachlor	0.8	8.6E-03	cm/hr	0.25	hr/event	13.27	hr/event	31.85	hr	0.064
2,3,7,8-TCDD Toxic Equivalence	0.5	8.1E-01	cm/hr	0.25	hr/event	6.82	hr/event	30.09	hr	5.573
Aluminum	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Arsenic	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Barium	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Cadmium	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Chromium	1	2.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Cobalt	1	4.0E-04	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Iron	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Manganese	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--
Vanadium	1	1.0E-03	cm/hr	0.25	hr/event	--	hr/event	--	hr	--

Notes

FA = Fraction Absorbed Water; default value = 1 (USEPA, 2004)

Kp = Dermal Permeability Coefficient of chemical in water (USEPA, 1996b and USDOE, 2011)

T(event) = Event Duration

Tau = Lag Time

T* = Time to Reach Steady-State

B = Dimensionless Ratio of the Permeability Coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis

Table E-10
Dermal Worksheet
Intermediate Variables for Calculating DA_{event}

Scenario Timeframe:	Current/Future
Receptor Population:	Resident Child
Exposure Medium:	Groundwater, Entire Aquifer

Chemical of Potential Concern	**FA**	**Kp**		**t-event**		**Tau (event)**		**t***		**B**
	Value	Value	Units	Value	Units	Value	Units	Value	Units	Value
Chlorobenzene	0.7	2.8E-02	cm/hr	0.45	hr/event	0.46	hr/event	1.09	hr	0.115
1,2-Dichlorobenzene	1	4.1E-02	cm/hr	0.45	hr/event	0.71	hr/event	1.71	hr	0.193
1,3-Dichlorobenzene	1	5.8E-02	cm/hr	0.45	hr/event	0.71	hr/event	1.71	hr	0.270
1,4-Dichlorobenzene	1	4.2E-02	cm/hr	0.45	hr/event	0.71	hr/event	1.71	hr	0.196
Tetrachloroethene	1	3.3E-02	cm/hr	0.45	hr/event	0.91	hr/event	2.18	hr	0.166
1,2,3-Trichlorobenzene	1	7.4E-02	cm/hr	0.45	hr/event	1.10	hr/event	2.65	hr	0.384
1,2,4-Trichlorobenzene	1	6.6E-02	cm/hr	0.45	hr/event	1.11	hr/event	2.66	hr	0.343
Trichloroethene	1	1.2E-02	cm/hr	0.45	hr/event	0.58	hr/event	1.39	hr	0.051
bis(2-Ethylhexyl)phthalate	0.8	2.5E-02	cm/hr	0.45	hr/event	16.64	hr/event	39.93	hr	0.190
Dibenzo(a,h)anthracene	0.6	1.5E+00	cm/hr	0.45	hr/event	3.88	hr/event	17.57	hr	9.677
Indeno(1,2,3-cd)pyrene	0.6	1.0E+00	cm/hr	0.45	hr/event	3.78	hr/event	16.83	hr	6.654
Naphthalene	1	4.7E-02	cm/hr	0.45	hr/event	0.56	hr/event	1.34	hr	0.203
Total PCB Aroclors (as Aroclor 1254)	0.5	7.6E-01	cm/hr	0.45	hr/event	7.18	hr/event	31.57	hr	5.244
alpha-BHC	0.9	1.2E-02	cm/hr	0.45	hr/event	4.57	hr/event	10.97	hr	0.080
gamma-Chlordane	0.7	3.8E-02	cm/hr	0.45	hr/event	21.21	hr/event	50.91	hr	0.294
4,4'-DDD	0.8	1.8E-01	cm/hr	0.45	hr/event	6.65	hr/event	25.99	hr	1.234
4,4'-DDE	0.8	1.6E-01	cm/hr	0.45	hr/event	6.48	hr/event	25.08	hr	1.067
4,4'-DDT	0.7	2.7E-01	cm/hr	0.45	hr/event	10.45	hr/event	42.51	hr	1.948
Heptachlor	0.8	8.6E-03	cm/hr	0.45	hr/event	13.27	hr/event	31.85	hr	0.064
2,3,7,8-TCDD Toxic Equivalence	0.5	8.1E-01	cm/hr	0.45	hr/event	6.82	hr/event	30.09	hr	5.573
Aluminum	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Arsenic	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Barium	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Cadmium	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Chromium	1	2.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Cobalt	1	4.0E-04	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Iron	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Manganese	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--
Vanadium	1	1.0E-03	cm/hr	0.45	hr/event	--	hr/event	--	hr	--

Notes

FA = Fraction Absorbed Water; default value = 1 (USEPA, 2004)

Kp = Dermal Permeability Coefficient of chemical in water (USEPA, 1996b and USDOE, 2011)

T(event) = Event Duration

Tau = Lag Time

T* = Time to Reach Steady-State

B = Dimensionless Ratio of the Permeability Coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis

RAGS Part D IEUBK Model Worksheet

APPENDIX E
RAGS D IEUBK LEAD WORKSHEET
Site Name: CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE, OPERABLE UNIT 3
Receptor: Child Resident (Age 0 to 84 Months)

1. Lead Screening Questions

Medium	Lead Concentration Used in Model Run		Basis for Lead Concentration Used For Model Run	Lead Screening Concentration		Basis for Lead Screening Level
	Value	Units		Value	Units	
Ground-water	2.6	µg/L	Arithmetic average for the entire aquifer, including 1/2 reporting limits for non-detected values.	15	µg/L	USEPA Regional Screening Level for tapwater use is the drinking water action level of 15 µg/L.

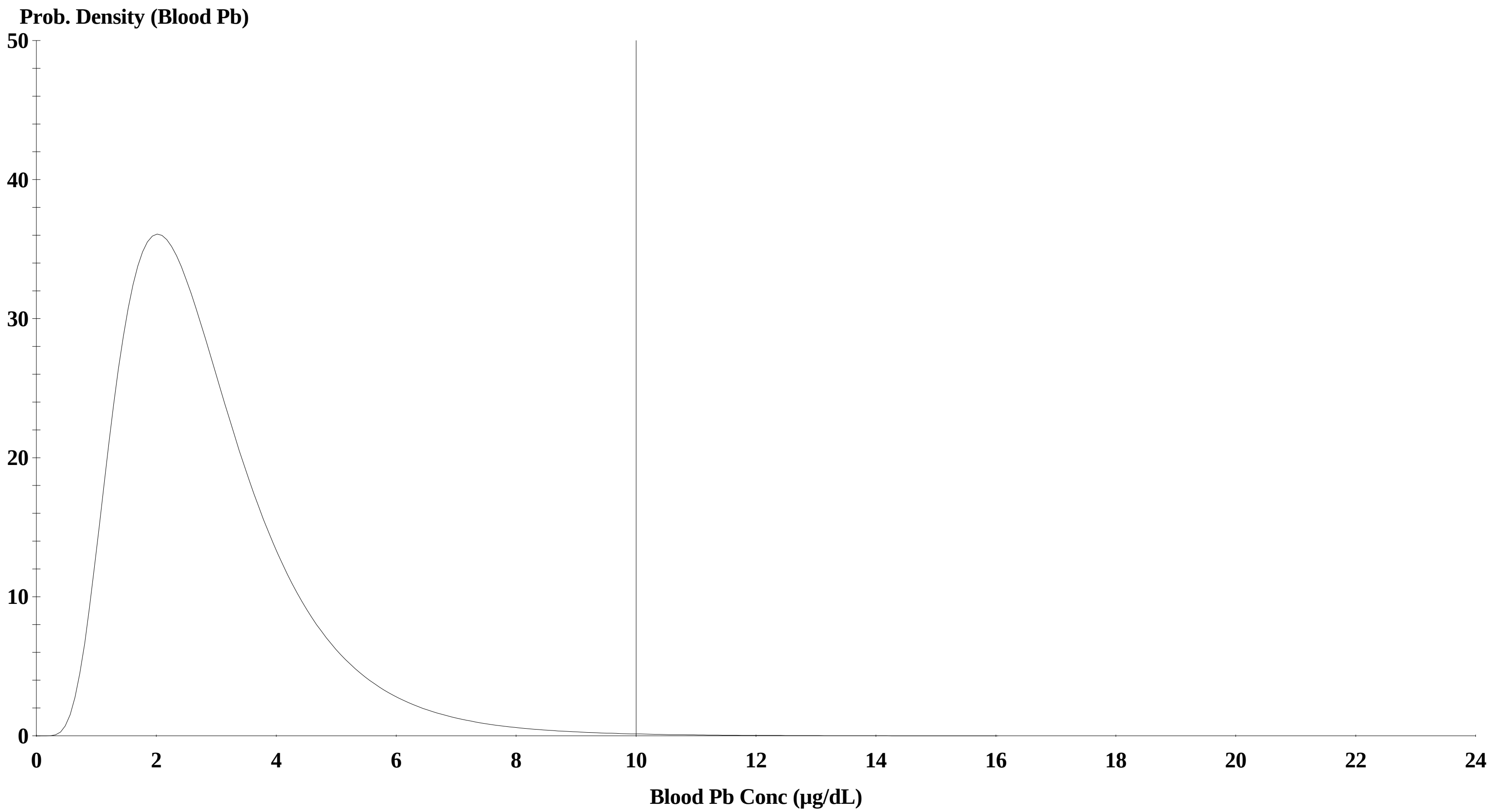
2. Lead Model Questions

Question	Response for Residential Lead Model
What lead model (version and date) was used?	USEPA IEUBK Model Win32, Version 1.1
Where are the input values located in the risk assessment report?	RAGS Part D **Table 3.1** (Appendix A) and this worksheet.
What range of media concentrations were used for the model?	Other than arithmetic average concentration in groundwater listed above, default media concentrations were used (i.e., 200 µg/g in soil, 0.1 mg/m^3 in outdoor air, indoor air 30% outdoor air, multiple source analysis for indoor dust).
What statistics were used to represent the exposure concentration terms and where are the data on concentrations in the risk assessment that support use of these statistics?	Arithmetic average concentration in groundwater, as shown in RAGS Part D **Table 3.1.RME**. Groundwater data for the entire aquifer are summarized in RAGS Part D **Table 2.1**.
Was soil sample taken from top 2 cm? If not, why?	Not applicable
Was soil sample sieved? What size screen was used? If not sieved, provide rationale.	Not applicable
What was the point of exposure/location?	Tap water use by a child resident outside the boundaries of the Former CDE Facility.
Where are the output values located in the risk assessment report?	The IEUBK output files are attached in **Appendix E**.
Was the model run using default values only?	Yes, with the exception of the groundwater concentration noted above.

Was the default soil bioavailability used?	Yes. Default media absorption fractions of 30% for soil and dust and 50% for water and diet were used. A default lung absorption of 32% was used for all age groups.
Was the default soil ingestion rate used?	Yes. Default total dust and soil intake values, in g/day, for the seven age groups are: 0.085, 0.135, 0.135, 0.135, 0.1, 0.09, and 0.085. Default ventilation rates, in m^3/day, for the seven age groups are: 2, 3, 5, 5, 5, 7, and 7. Default dietary intake values, in µg/day, for the seven age groups are: 2.26, 1.96, 2.13, 2.04, 1.95, 2.05, and 2.22. Default water consumption values, in L/day, for the seven age groups are: 0.2, 0.5, 0.52, 0.53, 0.55, 0.58, 0.59.
If non-default values were used, where is the rationale for the values located in the risk assessment report?	Not applicable.

3. Final Result

Medium	Result	Comment/PRG [1]
Groundwater	Arithmetic average concentration of lead in groundwater of 2.6 µg/L results in an estimated geometric mean PbB of 2.6 µg/dL and a 0.22% probability that the target PbB of 10 µg/dL is exceeded.	Not applicable.



Cutoff = 10.000 µg/dl
Geo Mean = 2.623
GSD = 1.600
% Above = 0.220
% Below = 99.780

Age Range = 0 to 84 months

Run Mode = Research

APPENDIX F

Alternate Human Health Evaluation, Excluding Groundwater Data from MW-06, MW-11, MW-12, and MW-14S

Appendix F, Table F-1
Evaluation of Detected COPC Concentrations in Entire Aquifer Data Set
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Chemical of Potential Concern (COPC)	**Detected Concentrations in Groundwater**																
	Shallow Bedrock Wells								Multi-Port Well Sampler Port								
	MW-06 (29-44 feet bgs)		MW-11 (34-59 feet bgs)			MW-12 (35-60 feet bgs)			MW-14S-01 (30-35 feet bgs)		MW-14S-02 (41-46 feet bgs)		MW-14S-03 (55-60 feet bgs)		MW-14S-04 (65-70 feet bgs)		
	Oct 2009	Mar/Apr 2010	Oct 2009	Mar/Apr 2010	July 2010	Oct 2009	Mar/Apr 2010	July 2010	Oct 2009	Mar/Apr 2010	Oct 2009	Mar/Apr 2010	Oct 2009	Mar/Apr 2010	Oct 2009	Mar/Apr 2010	July 2010
cis-1,2-Dichloroethene	8,800	1,000	390,000	53,000	NS	12,000	4,800	NS	130,000	46,000	94,000	43,000	58,000	32,000	15,000	15,000	NS
Tetrachloroethene	1,600	110	< 500	50	NS	< 250	11	NS	< 500	0.76	< 100	24	< 500	0.69	< 50	11	NS
1,2,4-Trichlorobenzene	< 40	24	320	360	NS	< 250	1,600	NS	< 500	8.5	< 100	140	< 500	3	340	320	NS
Trichloroethene	9,600	1,400	170,000	23,000	NS	16,000	8,800	NS	72,000	17,000	64,000	19,000	30,000	11,000	9,900	1,700	NS
Vinyl chloride	78	57	710	860	NS	< 250	43	NS	560	21	370	530	< 500	14	< 50	150	NS
Dibenzo(a,h)anthracene	< 0.1	5.5	< 0.1	< 0.1	NS	< 0.1	0.16	NS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.11	< 0.19	< 0.1	NS
Total PCB Aroclors	< 0.09	9.6	27	190	NS	3.5	16	NS	81	38	5.2	101	42	9.8	12,900	65	NS
Heptachlor	< 0.052	< 0.05	0.51	4.5	NS	1.4	5.1	NS	< 0.053	0.37	< 0.052	2.6	< 0.056	< 0.05	300	120	NS
2,3,7,8-TCDD Toxic Equivalence	NS	NS	NS	R	8.4E-04	NS	5.0E-04	1.0E-04	NS	NS	NS	NS	NS	NS	NS	2.1E-01	2.2E-01
Arsenic	1.8	1.7	1.4	2.2	NS	1.2	1.6	NS	43.3	9.1	52.8	5.5	45	7	72.3	7.7	NS

Notes
Concentrations shaded grey were not included in the BHHRA because they are greater than chemical-specific aqueous solubility limits.
Concentration units are µg/L.
bgs - below ground surface
NS - not sampled
R - indicates sample result was rejected

Appendix F, Table F-2
Revised EPCs for Alternate Evaluation of Entire Aquifer Data
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Chemical of Potential Concern (COPC)	**Exposure Point Concentration (EPC)**	
	Baseline Evaluation (µg/L)	Alternate Evaluation (µg/L)
cis-1,2-Dichloroethene	14,139	918
Tetrachloroethene	36	3.4
1,2,4-Trichlorobenzene	58	8.5
Trichloroethene	7,041	1,207
Vinyl chloride	53	12
Dibenzo(a,h)anthracene	0.17	0.12
Total PCB Aroclors	4.4	0.60
Heptachlor	3.6	0.17
2,3,7,8-TCDD Toxic Equivalence	2.6E-05	Not applicable
Arsenic	76	79

Appendix F, Table F-3
Comparison of Cancer Risks and Noncancer Hazards
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Human Receptor Population	Evaluation	Incremental Lifetime Cancer Risks				Non-Cancer Hazard Indices				COPCs with Cancer Risks > 1E-04 or Noncancer Hazards > 1E+00
		Exposure Routes			Receptor Total	Exposure Routes			Receptor Total	
		Ingestion	Dermal Contact	Inhalation		Ingestion	Dermal Contact	Inhalation		
Commercial/Industrial Worker	Baseline	N/A	1E-03	3E-03	4E-03	N/A	8E+01	2E+01	9E+01	cis-1,2-DCE; 1,2,4-TCB; TCE; DBA; Total PCB Aroclors; 2,3,7,8-TCDD TEQ
	Alternate	N/A	6E-04	5E-04	1E-03	N/A	2E+01	3E+00	2E+01	1,2,4-TCB; TCE; DBA; Total PCB Aroclors; 2,3,7,8-TCDD TEQ
Resident Adult	Baseline	4E-03	2E-03	1E-03	7E-03	2E+02	9E+01	4E+00	3E+02	cis-1,2-DCE; PCE; 1,2,4-TCB; TCE; VC; DBA; Total PCB Aroclors; Heptachlor; 2,3,7,8-TCDD TEQ; As
	Alternate	2E-03	1E-03	2E-04	4E-03	2E+01	2E+01	7E-01	4E+01	cis-1,2-DCE; TCE; VC; DBA; Total PCB Aroclors; 2,3,7,8-TCDD TEQ; As
Resident Child	Baseline	2E-03	9E-04	5E-04	3E-03	5E+02	2E+02	1E+01	7E+02	cis-1,2-DCE; PCE; 1,2,4-TCB; TCE; VC; DBA; Total PCB Aroclors; 2,3,7,8-TCDD TEQ; As
	Alternate	9E-04	6E-04	9E-05	2E-03	5E+01	5E+01	2E+00	1E+02	cis-1,2-DCE; 1,2,4-TCB; TCE; VC; DBA; Total PCB Aroclors; 2,3,7,8-TCDD TEQ; As

Notes
N/A - exposure route not applicable
cis-1,2-DCE = cis-1,2-Dichloroethene
PCE = Tetrachloroethene
1,2,4-TCB = 1,2,4-Trichlorobenzene
TCE = Trichloroethene
DBA = Dibenzo(a,h)anthracene
PCB = Polychlorinated biphenyls
2,3,7,8-TCDD TEQ = 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalence
As = Arsenic

APPENDIX G

Evaluation of ERT-5, ERT-6, and MW-18 Groundwater Data Only

Appendix G, Table G-1
Summary of Groundwater Data from ERT-5, ERT-6, and MW-18
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics, Inc. Superfund Site OU3

COPCs for Aquifer or Shallow Offsite SBB Groundwater Data Sets, also Detected in ERT-5, ERT-6, and MW-18	10/13/2009 24-34 ERT-5-01	10/13/2009 37-47 ERT-5-02	10/13/2009 50-60 ERT-5-03	10/13/2009 77-87 ERT-5-04	10/13/2009 93-98 ERT-5-05	10/13/2009 120-130 ERT-5-06	10/20/2009 26-36 ERT-6-01	10/20/2009 75-85 ERT-6-02	10/20/2009 93-103 ERT-6-03	10/20/2009 107-117 ERT-6-04	10/20/2009 128-138 ERT-6-05	10/13/2009 160-170 MW-18-01	10/13/2009 210-220 MW-18-02	3/24/2010 24-34 ft ERT-5-01	3/24/2010 37-47 ft ERT-5-02	3/24/2010 50-60 ft ERT-5-03
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.78	0.5 U	0.5 U	0.48	0.58	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.36	2	0.83	0.27	0.5 U	3.6	4.2	2.1	2.2	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.51	0.5 U	0.5 U	0.5 U	0.34	0.5 U	0.5 U	0.5 U	0.54	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl tert-butyl ether	1.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.54	0.5 U	0.5 U
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.48	0.95	2.4	28	0.5 U	0.55	0.8	6.5	45	52	52	0.5 U	0.5 U	0.5 U
bis(2-EHP)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.2	5 U	5 U
Dibenzo(a,h)anthracene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U
Indeno(1,2,3-cd)pyrene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.12	0.1 U
Naphthalene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Aroclor-1254	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.24	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.05 U	0.073	0.071
2,3,7,8-TCDD TEQ																
gamma-Chlordane	0.054 U	0.052 U	0.05 U	0.052 U	0.051 U	0.053 U	0.051 U	0.056 U	0.053 U	0.051 U	0.05 U	0.052 U	0.051 U	0.05 U	0.08	0.05 U
Aluminum	100	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Arsenic	2.2	1.3	1.9	1.9	2.3	2.4	5.3	3.8	1.6	2.4	2.7	24.8	54.7	0.85	1.1	1.5
Barium	182	197	129	107	107	77.8	790.5	294	219	187	91.3	47.7	49.3	158	192	121
Cadmium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.04	1 U	1 U	1 U	1 U	1 U
Chromium	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 U	2 U	2 U
Iron	180	100 U	100 U	100 U	100 U	100 U	1290	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Lead	1 U	1 U	3.4	1.5	3.2	1	1 U	1.5	1.8	1.4	2.4	2.3	1.7	0.52	0.71	0.94
Manganese	179	0.86	0.18	0.85	0.87	0.34	62.3	3.1	1 U	1 U	1 U	3	5	34.9	0.29	1 U
Vanadium	5 U	5 U	6.5	6.5	7.8	8.7	5 U	5.3	5.1	5.8	8.8	10.8	12.4	3.2	4.5	6.4

Appendix G, Table G-1
Summary of Groundwater Data from ERT-5, ERT-6, and MW-18
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics, Inc. Superfund Site OU3

COPCs for Aquifer or Shallow Offsite SBB Groundwater Data Sets, also Detected in ERT-5, ERT-6, and MW-18	3/24/2010 77-87 ft ERT-5-04	3/24/2010 93-98 ft ERT-5-05	3/24/2010 120-130 ft ERT-5-06	3/26/2010 26-36 ft ERT-6-01	3/26/2010 75-85 ft ERT-6-02	3/26/2010 93-103 ft ERT-6-03	3/26/2010 107-117 ft ERT-6-04	3/26/2010 128-138 ft ERT-6-05	3/24/2010 160-170 ft MW-18-01	3/24/2010 210-220 ft MW-18-02	Frequency of Detection	Range of Detected Concentrations	Exposure Point Concentration	Rationale
												(µg/L)	(µg/L)	
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	3 / 26	0.48 - 0.78	0.52	95% UCL concentration
cis-1,2-Dichloroethene	0.5 U	0.5 U	1.2	0.36	0.5 U	0.5 U	1.5	2.5	1.6	1.9	14 / 26	0.27 - 4.2	1.479	95% UCL concentration
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	3 / 26	0.34 - 0.54	0.375	95% UCL concentration
Methyl tert-butyl ether	0.23	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	3 / 26	0.23 - 1.2	0.359	95% UCL concentration
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 / 26	1.4	1.4	Single detected concentration
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.12	1 / 26	0.12	0.12	Single detected concentration
Trichloroethene	0.47	0.58	18	0.5 U	0.5 U	0.87	5.6	35	20	57	18 / 26	0.47 - 57	18.79	95% UCL concentration
bis(2-EHP)	5 U	3.5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 / 26	1.2 - 3.5	3.5	Dataset consists of two detected observations
Dibenzo(a,h)anthracene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.36	0.1 U	1 / 26	0.36	0.36	Single detected concentration
Indeno(1,2,3-cd)pyrene	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.58	0.1 U	4 / 26	0.1 - 0.58	0.155	95% UCL concentration
Naphthalene	0.1 U	0.1 U	0.1 U	0.084	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 / 26	0.084	0.084	Single detected concentration
Aroclor-1254	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.11	0.05 U	4 / 26	0.071 - 0.24	0.0919	95% UCL concentration
2,3,7,8-TCDD TEQ											1 / 2	1.1E-08	1.1E-08	Dataset consists of two detected observations
gamma-Chlordane	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	1 / 26	0.08	0.08	Single detected concentration
Aluminum	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	1 / 26	100	100	Single detected concentration
Arsenic	1.7	1.9	2.3	6.9	2.7	1.7	2.5	2.6	90.4	9.2	26 / 26	0.85 - 90.4	26	95% UCL concentration
Barium	97.8	101	81.1	885	308	236	189	76.7	55.6	47.4	26 / 26	47.4 - 885	256.6	95% UCL concentration
Cadmium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 / 26	0.04	0.04	Single detected concentration
Chromium	2 U	0.47	0.68	0.57	0.63	0.45	2 U	0.43	2 U	2 U	6 / 26	0.43 - 0.68	0.611	95% UCL concentration
Iron	100 U	100 U	100 U	1870	100 U	100 U	100 U	100 U	100 U	100 U	3 / 26	180 - 1870	444.3	95% UCL concentration
Lead	0.41	0.7	0.75	0.61	2.4	1.9	0.84	0.87	1	0.58	23 / 26	0.41 - 3.4	1.619	95% UCL concentration
Manganese	1 U	1 U	1 U	484	2.1	1 U	1.1	1.1	209	6.1	18 / 26	0.18 - 484	245.6	95% UCL concentration
Vanadium	6.7	7.1	8.3	3.4	5.7	5.5	6.3	8.7	5.5	9.6	23 / 26	3.2 - 12.4	7.324	95% UCL concentration

Appendix G, Table G-2
Cancer Risks and Noncancer Hazards Estimated Using Data from ERT-5, ERT-6, and MW-18 Only
Baseline Human Health Risk Assessment
Cornell Dubilier Electronics Inc. Superfund Site OU3

Human Receptor Population	**Incremental Lifetime Cancer Risks**				**Non-Cancer Hazard Indices**				**COPCs with Cancer Risks > 1E-04 or Noncancer Hazards > 1E+00**
	Exposure Routes			Receptor Total	Exposure Routes			Receptor Total	
	Ingestion	Dermal Contact	Inhalation		Ingestion	Dermal Contact	Inhalation		
Commercial/Industrial Worker	N/A	4E-04	1E-05	5E-04	N/A	1E+00	2E-02	1E+00	DBA; Total PCB Aroclors
Resident Adult	6E-04	7E-04	5E-06	1E-03	3E+00	2E+00	9E-04	5E+00	DBA; Total PCB Aroclors; As
Resident Child	3E-04	8E-04	2E-06	1E-03	7E+00	4E+00	3E-03	1E+01	DBA; Total PCB Aroclors; As

Notes
N/A - exposure route not applicable